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"THE ECONOMIC RESOURCES OF THE STRAITS SETTLEMENTS AND THE MALAY PENINSULA.

By H. N. Ridley Esq.

SIR Cecil Clementi Smith presided, on the 16th December, at an illustrated lecture given at the Imperial Institute by Mr. H. N. Ridley, Director of the Botanic Gardens, Singapore, entitled "The Economic Resources of the Straits Settlements and the Malay Peninsnla.'

Probably, said Mr. Ridley, no portion of the Empire was so little known to the English public as the Straits Settlements and the attached Federa'ed States. It was, however, one of the most thriving of the smaller colonies, and possessed in Singapore, the most important port in Eastern Asia.

Its heavy rainfall, of over 100 inches annually, was evenly distributed throughout the year; so, nnlike other tropical regions, there were no season. The trees, which were evergreen and for the most part bore flowers and frnits irregularly all the year round, grew with great rapidity; conseqnently it had been fonnd more suitable to cultivate plants whose prodnce was derived from the vegetative portion rather than from the fructificative. The climate, though hot, was neither unpleasant nor unhealthy, and cases of sun-stroke were almost unknown. Coolie labour on the estates was supplied by Japanese and Tamils; the Chinese, though very industrious and invaluable when working for themselves in agriculture; commerce, or mining, had not been found amenable to European methods of discipline.

The greater part of the Malay Peninsula, which consisted of hills rising to about 7,000 feet altitude with more or less flat country running along the coast-line, was or nntil recently had been, covered with dense forests; and the characteristic view from almost any of the hill-tops at the present day was one of endless trees, of which there were several thousand kinds, although to the casual observer they seemed very similar. These produced excellent timber, both hard and soft woods snitable for all kinds of purposes, while some of them, ebony and other ornamental woods, were suitable for cabinet work.

Among the trees of special interest Mr. Ridley mentioned the camphor, not the Japanese camphor tree from which the camphor of commerce was now obtained, but a much larger one, belonging to a different natural order, and from which camphor had originally been obtained some hundred of years before the discovery of the Japanese tree. This Malay camphor was obtained from the hollows of the trees but it was very scarce and far too expensive to come into the London market. It was sought by the Malays with quaint ceremonies, and generally nsed in magic and religious ceremonials by both the Malays and the Chinese.

Wood-oil was obtained from certain of the large trees by cutting a hole in the trunk about a foot across and six inches deep and lighting a fire therein. This caused the oil to flow out, which was caught in tins and used as varnish. Owing, however, to the death of the trees the supply of the oil had become so scanty that it seemed nearly to have disappeared from commerce. The sweet-scented incense gum, benzoin, was also obtained from one of the Malay forest trees, and formed the chief element in the incense used in churches.

The most important of the Malay jungle products, however, was gutta percha, without which the submarine telegraph cables could never have developed to their present importance. This tree, the *Isonandra gutta,* was confind to the Malay Peninsnla, Sumatra, Borneo, and the islands of the immediate neighbourhood. It was discovered in 1843, first being noticed on account of its property of becoming soft and easily moulded in hot water. Its high insnlating powers, and resistance to sea-water, were soon noticed, and it very shortly was in great demand for electrical work, surgical instrnments, and many other purposes. The tree was of very slow growth, but eventually attained great size. The gutta percha

was obtained by felling the trees and cutting rings through the bark all up the trunks, when it exuded in the form of white milk, which was collected in leaves and set into blocks of different forms.

So great indeed had been the demand that every accessible tree of any size had been felled, not only by the Malays, but by the wild tribes who rambled all over the forests, and consequently in large areas no tree large enough to produce seed remained, and the plant was on the verge of extinction. The trees produced seed very seldom, and although Mr. Ridley had offered large prices for some none had been forthcoming. The Government of the Straits Settlements had consequently stepped in and taken measures for the protection of the remaining trees. The amount of gutta percha produced by felling and cutting was very small in proportion to the age and size of the trees; one upwards of a hundred years old would produce but 2 or 3 lb.

However, a Frenchman in Singapore, had, about eight or nine years ago, discovered that, by drying the leaves and twigs of the tree, and grinding them to powder and then mixing the powder with water, the gutta percha floated to the top so that it could be skimmed off and pressed into blocks. He had started a factory in singapore, which had, at his death, passed into other hands and had been eventually transferred to France, whither the leaves and twigs were now sent to be worked. By this simple method, and by growing the plant in the form of bushes rather than trees, it was hoped that in time the Malay peninsula would be able to furnish the world with a good and regular supply of this valuable product.

The rattan was another important jungle product. It was the stem of a thorny, climbing palm which scrambled about and over trees by the aid of sharp hooks with which the leaves and flower-stems were provided. There were a great many different kinds of rattans, and Mr. Ridley gave an interesting account of the method of cutting them down and preparing them for shipment to Europe and the United States, for manufacture into chairs, baskets, etc. As the supply was hardly equal to the demand, the plant was now beginning to be cultivated, and a reasonable return might be expected with but very little expense.

Coffee was cultivated over a large area of the Peninsula, and the large seeded Liberian had been found to grow there very well indeed, and better than the more valuable Arabian variety; but, unfortunately of late, the price of Coffee had been so low that most of the planters were adding the valuable Para rubber tree to their estates. This tree, a native of the Amazon district in Brazil, had been introduced from Ceylon in 1884 to the Botanic Gardens in Singapore, where it has been found to grow with remarkable ease and rapidity, and to produce a very good yield of first-class rubber.

While coffee had been in the ascendant, however, the planters had not troubled themselves about rubber, but now, owing to the increased demand for the latter commodity, due in great measure to the rapid evolution of the bicycle and the moto car, the attention of planters all over the world had been directed to this product. A large number of plants produced rubber, of one kind or another, but that from the Para tree was by far the best. Attempts had been made to cultivate this tree in many parts of the world, but with only partial success. In the constantly damp and warm climate of the Straits Settlements, however, it has grown with astonishing rapidity. A tree raised from seed attained its full height of 60 feet in five or six years, after which it continued to increase in girth to about 4 feet, in twelve years. The expense of cultivation was very small, no manure being required, and the tree could be tapped when six years old, when it would produce about 2 lb. of rubber a year. Older trees produce more. The rubber was obtained by cutting first a narrow channel through the bark vertically, with slanting ones leading into it all the way down the trunk of the tree, at the foot of which a little box was placed with the lid so arranged that, although the rubber-milk could get in, dirt and rain-water could not. The trees were tappped in the afternoon and the rubber collected from the boxes on the following morning. Every day for a week, at 4 o'clock, a thin slice was cut off the edges of each slit, and more milk ran out until the tree was finally exhausted. The wounds were then left to heal, which usually took about one or two months. The trees could be tapped once or twice a year according to size, and the rubber thus obtained was worth from 4s. to 4s. 6d. a pound. Even at half that price the cultivation would be the the most remunerative of any in the East, and thousands of trees were being planted all over the Peninsula, as fast as the seeds could be procured.

The india rubber, *ficus elastica*, so common in pots in English houses, was being cultivated by many planters. Its appearance, however, was very different when grown into a large tree with great roots. It was a native of the Peninsula, and throve well there, but its rubber was of less value than that of the Para.

Another paying crop, which was cultivated wherever the soil was sufficiently sandy for its growth—generally along the sea-coast, was coconut; and large areas were devoted to its cultivation in Singapore, Penang, Province Wellesley, and elsewhere. In some places the trees were severely attacked by two kinds of large beetles, which burrowed through the shoots and soon caused the death of the tree. The destruction of trees, at one time, had been enormous, until a law had been passed compelling owners to destroy badly affected trees, and also the rubbish heaps in which one of the beetles bred. This law had had very beneficial results. The nuts were sold either for food, for which there was always a large demand, or as copra—made by splitting the nuts in two and drying the halves, which were used for the manufacture of oil and stearine.

The betelnut palm was also cultivated to a considerable extent, and although betel chewing had largely gone out of fashion in the Peninsula, there was still a considerable demand for the nut in India. It was also used to a small extent in European medicine.

The most useful of the palms, however, was the sago, which was planted in a good many places in the Peninsula. Three sago plants would give more nourishment than one acre of wheat, and one acre of sago as much as 163 acres of wheat; in fact sago gave a larger amount of food per acre than any plant in the world. The plant was grown from cuttings, or seeds, in wet swampy places, forming dense thickets, with its huge leaves 20 feet in length. The main stem crept along the ground and threw up great branch stems, about 40 feet high and 1½ feet through, which eventually produced at the top great panicles of flowers and fruits. The plant took twelve years to produce its first stem, after which its growth was more rapid, and fresh stems appeared regularly, so that at most times of the year, in a big plantation, there were generally stems ready to cut. These were felled when full size, but before the appearance of the flowers, and cut into pieces about two feet long. They were then split in half, the bark and woody exterior removed, and the sago manufactured from the inside white pith, first into sago flour and then into granulated or pearl sago. A full size stem would produce as much as 600 or 700 lb. of flour, and about 30,000 tons were exported annually from Singapore.

The tapioca plant was a tall, half-shrubby plant, resembling somewhat the castor oil. It was a native of South America, but had long been cultivated all over the East, and was very largely propagated from cuttings of the stem, which we just stuck into the ground, and, in a year or eighteen months, attained a height of about six feet, forming huge thick roots under ground. When these roots were of full size, the plant was cut down and the roots dug up and taken to the

factory to be manufactured into flake or pearl tapioca. This plant was always cultivated by the Chinese. Only three crops were taken off the land. Its cultivation, often a very paying one, was said to injure the soil, and so was not one upon which the Government looked with much favour. Tapioca and sago were, of course, used for many other purposes than as food.

Gambier, cultivated entirely by the Chinese was a climbing shrub. It was always grown in the open field in the form of bushes, which was severely cut every year. The branches and leaves were then taken to the boiling sheds, and, after going through various processes, the gambier was shipped to Europe for the use of tanners. Another, a totally different plant, the mangrove, produce a tan.stuff which was now finding its way into our markets. The mangrove was a tree, growing on the edges of tidal rivers and seashores, wherever they were muddy. This particular tan-stuff was also used in combination with indigo as a dye-stuff by the Chinese. Indigo, however, was not a large or important cultivation in the Peninsula. It was only grown to meet a small local demand.

Pepper was another plant generally cultivated by the Chinese, usually by gambier planters. It was raised from cuttings and climbed up large stems or posts. Formerly it had been a highly priced article, but of late years had fallen off very much and its cultivation in the Straits had diminished. Now however, the price had risen and the Chinese and Malays had recommenced planting.

The Straits Settlements were famous both for nutmegs and cloves, which were also chiefly cultivated by the Chinese. The nutmeg, as grown in the Straits, was quite a small bushy tree with deep green leaves and fruit resembling a small peach. When ripe the husk split partly open, exposing a black seed, covered with a beautiful scarlet network. This net-work, the mace, was taken of when the fruit was ripe and dried in the sun. It was often more valuable than the nutmeg itself.

This cultivation was an old established one. In 1848 Singapore alone supplied over four million nutmegs, but in 1860 a disease was developed which entirely destroyed the cultivation in that place, and nearly did so in Penang. European planters had been ruined, and their estates and houses sold for very small sums. The Chinese then started the cultivation in Penang, and had kept it up to the present time.

Mr. Ridley, not long ago, had his attention called to what he considered the same disease, and on investigation he found it due to a minute beetle which burrowed into the bark of the tree, beneath the ground, so that its presence was not noticed until, by its burrows, the cambium, or living layer of the bark of the tree, was destroyed and the tree appeared to die suddenly. Had this discovery been made in 1860 the cultivation could easily have been saved. This was, he said, an excellent example of the importance of the entomologist to the planter.

The most important native cultivation in Singapore was the pineapple. The plants grew from cuttings, placed close together, and completely covered the ground. The fruit, when ripe, was cut and brought into the town in cartloads to the preserving factories. The industry of tinning pines was a large and very remunerative one. By far the largest number of the best preserved pines in the markets of the world came from Singapore, where the price of a pine varied from ½d. to a penny a piece. The plants produced fruit nearly all the year round, were very easy to cultivate, grew in the worst of soils, and its only enemies were porcupines and wild pigs.

From the leaves of the pine a very beautiful fibre was extracted. The leaves of the ordinary varieties, however, were too short to be used successfully for this purpose, the most suitable leaves being from plants in waste ground that had grown up with grass and scrub among them.

The Malay Peninsula was remarkable, according to the mineralogist, for having given samples of almost all the known elements, but these were so sparsely and generally scattered over the whole region that the expense of collecting most of them would hardly repay the cost. Tellurium, wolfram, and titanium were comparatively common. Gold, silver, lead, zinc, copper, antimony, and other metals all occurred in small quantities widely scattered over the country; but little mining had been done except for gold and tin. In former years the Peninsula produced a good quantity of gold; the yield, however, at the present time was but small.

Tin was the mineral of the country, being found there in great abundance; in fact, more than one-half the world's supply was derived from the Peninsula. The greater part of the mines were alluvial, though lodes had been found and worked. Rich beds occurred in the stream valleys at the base of the hills in Selangor and Perak, and were worked by the Chinese, who dug to no great depth, and washed the alluvium with very primitive sluices. The tin was sold to European firms, melted into ingots at Singapore, and then exported.

In conclusion, Mr. Ridley said that in the course of a single lecture it would be impossible to give more than an idea of the great wealth of resource of the colony. He had attempted to describe rather the peculiar vegetable products of the country, so as to show what had been done in the introduction and cultivation of new and exotic plants during the last half-century. When Sir Stamford Raffles planted the English flag on Singapore Island in 1819, it had been inhabited only by about 200 fishermen and pirates; now it was the most important port in Eastern Asia, with a population a thousand times as large. Then the Native States had been in a constant state of war and anarchy, and the natural wealth of the country was neglected; now, owing to the energy of the white man, aided by patient hard work of the Chinaman, the forests had been felled, mines opened up, cultivation introduced, and commerce developed. An era of justice, freedom, and peace to all had been inaugurated, and the country had become one of the most thriving of our tropical colonies.

There were still, however, large areas of country practically unexplored, and doubtless much mineral wealth untouched; and Mr. Ridley was of opinion that the colony was only really in its infancy, and that gradually and steadily the work of progress would continue year by year, and he was confident that the future of the Malay Peninsula would be one of great and increasing prosperity.

The lecture throughout was illustrated by a well-selected series of slides, many of which had been specially prepared.

The chairman, in proposing a vote of thanks "for a very attractive lecture," referred to Mr. Ridley's commendable simplicity of language, and to his avoidance of technical expressions, which had enabled all those present to carry away every single piece of information which he had been good enough to impart to them.

Sir Cecil Clementi Smith said he should like to take this opportunity of drawing attention to the work that Mr. Ridley, and the Directors of other Botanical Gardens, were doing in going out to the Colonies and devoting themselves with ardour and zeal to economic botany. They, in a quiet and unobtrusive way, were winning victories over nature of which the ordinary man in the street knew absolutely nothing. They did not get honours thrust upon them or mentioned in the newspapers, but their work was neverthless of extreme value in forwarding our efforts of making human life more endurable and more delightful. Mr. Ridley's labours—only a small portion of which he could have referred to that evening—in experimenting on the cultivation of plants, and the similar work of the Directors of

other Botanical Gardens, were of immense benefit to the Empire. Most people in this country knew Kew as a place where they could see beautiful and attractive things grow. It was, however, much more than that. The making the gardens attractive formed but a small part of the duty of Kew. It was a mighty organisation and the centre of the botanic activity of the Empire; and Mr. Ridley would probably be the first to acknowledge the great assistance he had received in his botanical efforts from the Authorities of the Royal Botanic Gardens, Kew.—*Imperial Institute Journal.*

PHOSPHORIC ACID AND POTASH IN SOILS.

The fertility of a soil is estimated, not by the total amount of chemical constituents which it contains, but chiefly by the availability of the plant-food ingredients.

Phosphoric acid, though soluble in water, is not easily washed from the soil, either by rain falling upon it or by artificial waterings.

In some recent investigations by Dr. Bernard Dyer with soils obtained from the Experimental Station at Rothamsted, it was found that there was little risk of loss of either phosphoric acid or potash, even if larger quantities are applied at one time than what are required for the immediate use of the growing crop, but that these elements accumulate in the upper layers of the soil, where they remain until taken up by the plant. It was, however, found that these ingredients when derived from farmyard or stable-manure were less stationary than when derived from artificial manures; considerable quantities were found to have penetrated into the subsoil even as low as 27 inches from the surface. This is doubtless due to the more open and porous texture of the soil under the influence of continuous applications of large quantities of organic and bulky manures.

When a manurial application of superphosphate, combined potash, and other mineral salts is made, a distinct influence is exterted in the retention by the soil of phosphoric acid in a less fixed and, therefore, presumably more available condition; while if, for want of nitrogen in the soil, the growing plants have been unable to utilise all the phosphoric acid thus rendered available, more of it descends to the subsoil, as a result of the soluble action of these alkali salts. The importance has for many years been fully recognised by the intelligent horticulturist of applying nitrogenous manures in combination with phosphates, and the reason for this practice is shown in the foregoing statement.

In some of the vineyards of France it was found that there was a feeble development of wood, a falling-off of blossoms, diminished yield of Grapes, diseased leaves and roots, with a consequent retrogression of fruit quality. Attempts were made to remedy this defect by the application of abundant dressing of cow-manure—a material which has long been recognised to be one of the best of fertilisers available for the purposes of viticulture; nevertheless, this treatment proved utterly incapable of arresting the gradual exhaustion of the soil. Old vineyards exhibit a continuously progressive falling-off in fertility, and require digging at intervals, which become more frequent, or even, after a short period, they frequently have to be replanted. It is readily conceivable that soil which is frequently being turned over, so that fresh portions are always brought in contact with the roots ramifying in it, must, in course of years, lose much of its pristine richness, that cannot be completely restored by cow-manure alone.

The writer is acquainted with a plantation of Black Currant bushes which had been manured year after year with heavy dressings of peat-moss manure, and yet this material utterly failed as a restorer of soil fertility; the Currant-trees blighted, lost their leaves, and the fruit was scanty and of poor quality. After various trials it was found that to ensure perfect nutriment of the bushes, and to render possible the production of good and full yields of fruit, chemical manures providing available phosphoric acid must be resorted to. Phosphoric acid is directly connected with the increased development of fibrous feeding roots within the surface soil, that enables the plant to obtain the maximum of benefit from rainfall and bright sunshine. This is the special effect of phosphatic manures when applied to superficially rooted crops, such as Turnips, Onions, Potatos, Carrots, &c., and it is by virtue of this development that these crops so markedly exhaust the available nitrogen within the soil, and especially of the surface soil.

In regard to the element potash, it is sometimes stated that this ingredient is of relatively less importance than either nitrogen, phosphoric acid, or lime; partly for the reason that fertile soils are naturally richer in potash, and because the generality of plants remove a smaller quantity of this element from the soils than of the other substances mentioned.

Until recent years it had not been made quite clear what function potash exactly performed in the plant, although it has been proved over and over again that no plant is able to grow satisfactorily unless potash be present in a more or less available condition within the soil.

A theory was at one time held that soda, which is not an indispensable plant ingredient, was capable of replacing potash in the plant; but this has now been shown to be false. No other substance can replace potash, which is an essential constituent of all plants.

According to investigations at Rothamsted, it is found that the presence of available potash in a soil is an important condition of the formation in plants of carbo-hydrates generally. It is always to be found in the actively growing parts of vegetation, as in the growing buds and shoots, and it exists in relatively large proportion in the seed. In the culture of Potatos potash is a most necessary ingredient in the production of the carbo-hydrate starch; and in the culture of Turnips, Carrots, Beets, and all descriptions of fruits, the carbo-hydrate sugar is greatly dependent on a liberal available supply of potash—and the richer the soil may be in the element nitrogen, which necessarily increases the luxuriance and succulence of growing plants, the more potash will be required. In fact, the great function of potash is, that it acts as a carrier of the ingredient nitric acid to growing parts of vegetation, and assists in the maturation, colouring, and ripening of fruits.

Now, there are some Apples which are fit for table in early autumn, while there are others which only become ripe when kept over the winter. Experiments have shown that succulent fruits, such as Apples and Pears, are remarkably influenced by the different elements of manure, not only with regard to their size, but also with regard to composition and maturity of the fruit juices; thus, the substances, potash and phosphoric acid, favour early maturity, while nitrogenous manures retard ripeness. Consequently, Apples and Pears that are required for early market or consumption, may be stimulated to forwardness by dressings of superphosphate of lime, basic slag, and potash; while fruits that are grown more exclusively for winter use may be retarded by making the ingredient nitrogen of greater prominence in the manurial mixture than either potash, phosphoric acid, or lime. Further, the later crops having the whole season for their growth, greater dependence can be placed upon the natural resources of the soil.—J. J. Willis, Harpenden.—*Gardeners' Chronicle.*

PLECTRANTHUS AS A VEGETABLE.

In a recent issue of the *Journal de l' Agriculture Tropicale*, attention is called to a paper of M. Lemarie on the tubers of Plectranthus as a vegetable. These plants are Labiates, closely allied to the already known Stachys affinis; they produce tubers that can be used similarly. MM. Paillieux and Bois, who in-

troduced this plant (and also the Stachys), have failed to acclimatise it in France, owing to insufficient heat, but M. Maxime Cornu introduced it successfully into Madagascar, the Congo, Gaboon, the Soudan, and Indo-China, whence excellent repoits of it have been obtained, testifying to its value in countries where Potatos do not thrive. The tubers of Plectranthus even exceed in amount of starch and farinaceous properties those usually cultivated in the colonies, and those of Stachys tuberifera (affinis). There are several species of Plectranthus, and they are not easily identified; most of them are natives of tropical Africa, India, and Malaya. At Hanoi in 1898 four small tubers, the size of a nut, were planted in the botanic garden, and from these M. Lemarie raised gradually increasing crops of tubers, that in January, 1900, were as large each as as a hen's egg, and in their entire weight attained to 208 kilos., or about twice that number of English pounds. At the same time, very similar tubers were distributed which, when cultivated, showed such differences that they were determined to be distinct species. In the flowers the tint of blue and the position of the stamens with regard to the pistil varied. M. Cornu gave the first plant here mentioned the name of Plectranthus Coppini. Dr. Heckel prefers the name Coleus Coppini. MM. Pailleux and Bois received from Réunion tubers of yet another species, known in the Transvaal; these on trial proved to be those of P. tuberous (Coleus tuberosus). Now it is identified with P. ternatus. In 1887 the late M. Pierre, Director of the Libreville Botanical Garden, introduced the new vegetable into the Congo, where it was highly valued. The *Potager d'un Curieux* mentions yet a fourth species, Coleus tuberosus, cultivated in Ethiopia; this has since been identified with *C. edulis*. Various other species have also been reported from tropical districts, but some of these are doubtless identical with those already mentioned, and when the vegetable receives further attention, the list of distinct species will be diminished. The properties of the varieties are practically alike. In parts of Tonkin the Plectranthus tubers will fill an otherwise unfertile period between May and October, leaving the ground free for other crops the rest of the year. This remark applies to other countries also. M. Lemarie judiciously remarks that before drawing hasty conclusions or planting the new tubers on too large a scale, attention should be paid to developing those that are largest of size, and in hastening on also the period of growth as much as possible. The species mentioned as producing edible tubers are Coleus tuberosus (Malaya,) Coleus barbatus (East Tropical Africa, India), Plectranthus esculentus (Natal), Plectranthus floribundus (tropical Africa).—*Gardeners' Chronicle.*

OUR PRINCIPAL TIMBERS

(By W. Maiden, New South Wales.)

IRONBARK.

We have four ironbarks:—

1. The white or grey iron bark;
2. The narrow-leaved ironbark;
3. The broad-leaved ironbark; and
4. The red ironbark, or mugga.

(No.1) *Eucalyptus paniculata*, Sm., is confined to the coast districts, and is paler than the others, although it varies in colour to a pinkish and even pale red colour, so that in the south it is sometimes known as "red ironbark"; this is the hardest, toughest, and most esteemed of our ironbarks.

(No. 2) *Eucalyptus creba*, F. v. M., is very widely diffused. It is the principal ironbark in that enormous stretch of country between Dubbo and Pilliga, &c., and also forms a part of the ironbark country east of Dubbo. But in greater or less abundance is it found over the whole of the north-eastern fourth of the State. It is red in colour, is known in the trade as "red ironbark," and is a valuable timber. It is a narrow-leaved, drooping species, the most graceful of the group.

(No. 3) *Eucalyptus Siderphloia*, Benth.—This is largely developed in the Clarence River Ironbark district, but it extends along the coast and for a considerable distance south of Port Jackson. Like the preceding one, it also is well developed in the interior, though not to so great an extent. It crosses the dividing range and is abundant north of Dubbo, and is more or less diffused in the *creba* country between the interior and the coast, but it is much less plentiful in most districts than *creba*. It is always known as red ironbark, and is a valuable timber though, occasionally it is too free to be classed as a best ironbark.

(No. 4) *Eucalyptus sideroxylon* A. Cunn.—This is *par excellence* the ironbark of the interior; at the same time there are few districts of the State, even in the coastal belt, in which it is not found sparingly. It penetrates furthest into the interior of the ironbarks being found at least as far west as Nymagee and Mount Hope, is well diffused in the south-western portion of the State, where it is the only ironbark tree, and is the only ironbark that extends into Victoria. In the northern half of the State it is also found, but, as a rule, not forming dense forests. It is a less compact tree than the others, yields timber of a deep-red colour and, although the least valuable of our ironbarks, is a valuable timber, often the best in the districts in which it grows.

RED HARDWOODS.

Timbers of this colour are usually very durable, hence people who have been victimised by receiving bad pale hardwoods frequently specify only red hardwoods. But even amongst red hardwoods we may have inferior timbers, some of the white gums, for example, having redwood. Our red hardwoods include—

1. Red mahogany (*E. resinifera*, Sm.).
2. Grey gum, which includes two species (*E. Punctata*, DC., and *E. propinqua*, Deane and Maiden).
3. Murray red gum (*E. rostrata*, Schlecht).
4. Forest red gum (*E. tereticornis*, Sm.).
5. Sydney blue gum (*E. saligna*, Sm).
6. Woollybutt (*E. longifolia*, Link and Otto).

The whole of these belong to the coastal belt, with the exception of the Murray red gum, whose principal habitat has already been indicated; it also is found near watecourses in the greater part of the western half of the State.

Red mahogany is chiefly found in the north Coast districts, though it is sparingly found for many miles south of Sydney. It is of a rich-red colour, and is one of the most durable of our timbers. It has a fibrous bark, and is a handsome tree.

Grey gums have bark of a dull grey colour, and somewhat blotched. The bark is a little roughish, in contradistinction to the smooth and even shiny appearance of that of some of our gums. Grey gum is one of the most valuable timbers of New South Wales, and is one of the principal timbers to be relied upon as an ironbark substitute, and thus to arrest the depletion of our ironbark forests. The best description of it as a timber lies in the fact that it is difficult to tell it from red ironbark on appearance only; an expert usually discriminates between the two by noting the tensile strength of a fibre. It is remarkably durable timber, and the only cases in which it should not be substituted for ironbark are where the tensile strength of best ironbark is required. It is largely used and esteemed in New South Wales, and can be recommended with the utmost safety to the foreign buyer.

Murray red gum is well and favourably known partly because it is the most gregarious of New South Wales trees. As with the Western Australian jarrah, so with Murray red gum, there is no difficulty in supplying a practically unlimited demand

of a timber of one uniform quality. We have other trees yielding timber of quality equal and even superior to these two, but because they are more scattered in distribution, there is always some liability to admixture with other timbers.

The forest red gum is botanically closely related to the Murray red gum; in fact, in their extreme forms the species run into each other; but, as a general rule, while the Murray red gum frequents river banks and flats, the forest red gum generally (but by no means always) prefers dry, open forests. Its durability is superior to that of Murray red gum, many experts always selecting it in preference to the latter when both are available. This preference of forest red gum is another instance of the general truth of the observation that the best timbers grow in dry or, at least, well drained localities.

The Sydney blue gum may be so called to distinguish it from the pale-coloured blue gum (*E. globulus*, Labill.) of Tasmania and Victoria. It, however, occurs in both north and south Coast forests, preferably on rich damp land or flats. In this respect it is similar to Murray red gum. It forms magnificent straight trunks, is extensively used, being one of the best of our timbers where durability is required. It is much sought after for felloes of wheels.

Woolybutt, found in the south Coast forests, is the least known of the group. Yet, although not of the first-class on account of deficient tensile strength, it is undoubtedly a durable and generally useful timber. A good many people use it without knowing what it is, but it can stand on its merits, I think. Its bark is sub-fibrous, and its timber is not unlike red ironbark.

I have omitted a few of our Eucalyptus hardwoods that I might have included, but time does not permit of the inclusion of a complete list.

Turpentine and Brush Box.—Turpentine and brush box are useful hardwoods, and both occur in the coastal forests, the former from the Shoalhaven to the Tweed, and the latter in the northern forests from Port Stephens northwards, usually in brushes, but often in open forests. Turpentine is botanically known as *Syncarpia laurifolia*, Ten.; and brush box is *Tristania conferta*, R. Br. Though not Eucalypts, they are closely related thereto. Turpentine is so called because of the peculiar oleo-resin it exudes; it forms magnificent straight trees in deep gullies, and is, perhaps, the most generally useful of our timbers resistant to marine borers, hence its very extensive use for piles in harbour works. It also has the great merit of being almost uninflammable, and hence is sometimes used for beams in buildings. Brush box is a durable timber, obnoxious to white-ants; it has other merits, and in spite of its tendency to warp, it should be more largely employed than it is at present. It is one of the most beautiful of our trees, and is often seen in gardens and boulevards under the name of "Lophostemon."

Cedar, Beech and Hoop Pine.—These valuable timbers I must dismiss in a few words. They are chiefly found in the area marked blue on the map, as already indicated, though cedar is found in patches in mountain fastnesses in a latitude as far south as Sydney. Red cedar (*Cedrela australis*, F. v. M.) is one of our few deciduous trees, and is a denizen of rich brush forests. The timber takes the same place here that the West Indian mahogany does in Europe; our cedar being, however, much lighter in weight. Closely allied to it and substituted for it to some extent, are Rosewood (*Dysoxylon Fraserianum*, Benth. and red bean (*D. Muelleri*, Benth.), valuable timbers, though less esteemed than red cedar. White beech (*Gmelina Leichhardtii* F. v. M.) is another instance of a handsome tree yielding a valuable timber. It is of a pale colour, durable, does not shrink much, and is one of the best carving timbers we have. It is the most esteemed of a number of brush timbers of the same class, of which flindosa or cudgerie (*Flindersia australis*, R. Br.) is one of the most important. Hoop pine, or white pine, or Colonial pine, or Richmond pine, are all names for the timber of *Araucaria Cunninghamii*, Ait., which occurs in brush lands at the heads of our northern rivers. Araucarias form remarkable looking trees in the forest with their branches in whorls and their conical habit. They are more often planted for ornamental purposes than for timber. The hoop pine is our most abundant soft wood of the pine class, and is a useful timber, particularly in a country whose predominant vegetation is hardwood, yet it falls far short of the best soft woods of the Baltic and the Pacific Slope.

Cypress pine covers extensive tracts in the drier pastoral districts, and is chiefly confined to the western and southern plains and tablelands. It is usually more or less admixed with box of various kinds, although there are large areas entirely covered with pine. The cypress pine area has been already indicated on the map, and the pines therein consist mainly of two species, Murray or white pine (*Callitris verrucosa*, R. Br.) and red or black pine (*Callitris calcarata*, R. Br.). Other species extend to the Coast ranges and tablelands forming for example, dense forests in New England gullies), and even to the Coast, the beautiful cypress pine of Port Jackson being a case in point. Cypress pines are beautiful trees, and yield valuable timber in the arid districts in which they grow. Such timber is usually highly ornamental, even garish, in figure and colouring. Its chief merit is its resistance to white-ants, which enables it to be used for telegraph and fence-posts, in country infested with those insects and carrying but little other timber. It is also commonly used for house construction, and stands well. It is full of aromatic resin, and hence burns readily, diffusing a sweet fragrance. The attention of the forester has, during recent years, been a good deal devoted to thinning areas of cypress pine, work which will afford the State an adequate return if it be carried out under experienced direction and on business principles. Residents of the Coast districts do not readily realise what the conseravtion of our cypress pine forests means to the arid western districts which do not possess the abundant and comparatively accessible forests of the Coast belt. Cypress pines are small or medium-sized trees, compact and shapely in habit, and quite different in appearance to the hoop pine. They grow readily (too readily many people think) from seed, and are well worthy the attention of those who desire to cultivate the most horticulturally desirable of our native plants.

Miscellaneous.—I have only time on this occasion to mention by name brown pine (*Podocarpus elata*, R. Br.) of our northern forests; the silky oaks (*Grevillea robusta*, A. Cunn., and *Orites excelsa*, R. Br.) of our northern rivers and tablelands; the black bean (*Castanospermum australe*, A Cunn.), from the Clarence to the Tweed; the tulip wood (*Harpullia penduala* Planch.) of the northern brushes; the myall (*Acacia pendula*, A. Cunn., of our western plains); the she-oaks (*Casuarina*) distributed practically all over New South Wales.—*Indian Forester.*

A RUBBER PLANTATION IN GUATEMALA.

The large specimen of crude rubber shown at the entrance to the Guatemala pavilion at the Paris Expositon of 1900, and for which a good medal was awarded, was produced from cultivated trees (*Castilloa elastica*) on the hacienda "El Baul," in Guatemala, on the Pacific slope. This plantation was specially mentioned by Dr. Paul Preuss, in reporting on his expedition to Central and South America, under the auspices of the German colonial committee. It has more recently been referred to at length—because of its size, of the care taken in the extraction of rubber, and of the good quality produced—in the *Journal d' Agriculture Tropicale* (Paris), from which the details that follow have mainly been derived.

The plantation "El Baul," until recently the property of Joachim Asturias, is now in possession of a wholesale mercantile firm of Hamburg, who are extensively interested, like many other German houses in coffee planting in Guatemala, and its management is in the hands of Fritz Konig. He, by the way, is a brother-in-law of P. Ossaye, owner of the coffee, vanila, and rubber plantations "Arenal" and "Seamay" in the same region. Such details are mentioned here as indicating that large and permanent planting interests exist in Guatemala, based upon outside capital, as a result of which much experience has been gained in such matters, which is shared by many persons of repute and success, whose confidence in the practicability of rubber cultivation is entitled to consideration.

According to Rene Guerin, director of the Central Laboratory of Guatemala, writing in the *Journal d' Agriculture Tropicale*, the plantation "El Baul" comprises about 50,000 rubber trees, of which 30,000 have reached a productive stage, being from 10 to 15 years old. Dr. Preuss, by the way, writing two years earlier, mentioned 20,000 trees between the ages of 15 and 20 years. The soil, very liberally watered, is divided into sandy and black-earth zones, though no difference has been observed either in the grown or the productiveness of the trees planted in the two zones. The vegetation is continuous, but at the beginning of the dry season—March and April, when the seeds ripen—the leaves turn slightly yellow and fall.

The trees growing in the plains furnish at all seasons a latex of the same quality. The trees on the higher altitudes, and which are for this reason less well watered, yield during the rainy season a larger quantity of latex than during the dry season. However, as this latex is less rich in caoutchouc, the true yield is the same. The rubbr trees which have developed in the plains, exposed to all weathers, begin yielding seed from the third year. Those growing in the woods develop much slower, and at that age have not reached a height above 3 meters. But as soon as these have attained the height of the surrounding trees, and receive the sun's rays direct, their development proceeds rapidly and they reach large dimensions and possess exceptional vigor.

In extracting the latex, incisions are made in the bark horizontally, at a distance of $1\frac{1}{4}$ inch apart, so as to not girdle the tree completely. The latex coagulates spontaneously on exposure to the air, and at the end of two or three days the rubber can be gathered from the tree in bands, which, after being washed, may be rolled together into balls. Each tree yields about 125 grams of rubber (from incisions in the trunk alone, and without the branches), and as the cuts will heal within three months, it is possible to make four extractions each year, giving a total yield of 500 grams [=1 1-10 pound.] The annual yield of 1000 grams [=2 1-5 pounds] mentioned in Dr. Preuss's report, resulted from making incisions in the branches as well as the trunks, but this involves an undesirable amount of labor.

Much thought has been given on the plantation "El Baul" to the choice of a tool for incising the rubber trees, with a view to affording a suitable outlet for the latex, without cutting into the wood, which contains no latex, and the wounding of which tends to decay. Dr. Preuss found in use in Guatemala for this purpose a sort of transformed saber, a sketch of which appears in the first of the two cuts herewith. Senor Asturias has had made to

order, in the United States, the tool illustrated in the second cut, which is regarded as superior to the old model. The latter comprises a blade of tempered steel—square at the end, about 3 inches long, and at the top about $1\frac{1}{3}$ inches wide—mounted in a hard wood handle $3\frac{1}{2}$ inches long. The steel blade diminishes in thickness from the handle, until at the other end it does not exceed the thickness of a playing card. The left angle of the blade is turned over so as to form a rounded gutter, about finger wide, and at 45 degrees to the axis of the tool. The left side of the blade is notched right at the gutter, so that the lower end of the gutter projects at that side. The parts that do the cutting are the two sides of the turned over angle.

M. Guerin states that Senor Asturias intends trying a new process of extraction, by the employing a vacuum, in the hope of accelerating the flow of latex, and adds: "It would be desirable if other cultivators, intelligent and progressive like M. Asturias, would display the same activity in the improvement of rubber cultivation and the rubber product." In too many cases, however, the collection of rubber is left to the native, who injure the trees unnecessarily, besides producing a poor quality of rubber by the use of soap or vegetable compounds, whereas by the spontaneous coagulation of the latex, after the complete elimination of the *serum*, an article of superior quality may be derived from the same trees.

It was found by Senor Asturias that trees on his plantation which presented precisely the same appearance, yet yielded different qualities of rubber. M. Guerin forwarded specimens to the museum of natural history at Paris, where Jules Poisson, of the museum staff, has discovered differences in the fructiferous receptacles of the seeds, and if further engaged in endeavoring to discover weather different species exist. While some of the trees yield caoutchouc of a superior quality, the product of others remains after coagulation sticky, glue like, and with little elasticity. There is also a perceptible difference in the color of the latex, that from both trees being white, but in one case with a tinge of yellow and the other with a grayish tinge.

The question of differences in the product of the *Castilloa elastica* is by no means new, but generally the trees not yielding the true rubber have been supposed to bear outward marks by means of which they could be avoided by persons having any experience in hunting rubber. By the way, in connection with the subject, it is interesting to quote from Dr. Preuss: "One has repeatedly asserted to me that there were, on the other hand, places where *Castilloas* exist that are rich in caoutchouc, and yet whose latex flows along the trunk, so as to be collected in liquid state in vessels, but I have never been able myself to prove the fact." Which would indicate an interesting difference between the trees on "El Baul," the latex of which, as above stated, coagulates on the trunks, and these in Mexico, for example, whose latex flows more freely and requires to be coagulated by other means.—*India Rubber World*.

THE TREATMENT OF OLIVE OIL IN FRANCE.

In an interesting report on the treatment of olive oil in France, R. P. Skinner, United States Consul-General at Marseilles, points out that the manufacture of crude olive oil in Europe has undergone comparatively little change since Scriptural times. The olive tree gives a good yield of fruit every two years, which is gathered in France in either November or December. In Italy the picking season is in either February or March. The rule is to collect the olives before their maturity, without which they fall, become bruised and give an oil green in color and sharp in taste,

Gathered too long before their maturity the oil extracted has these same disagreeable quantities, and it is therefore necessary to recognize with certainty the proper moment for taking them from the trees. At first green, they become yellow, then red and finally reddish brown, at which point they have arrived at the desired state of maturity. The olives found upon the ground are placed aside, and the trees are then shaken in order that the completely ripe fruit may also fall and be put apart. The oil extracted from these olives is of inferior quality and has the flavor of the fruit itself. The olives remaining upon the tree are either picked by hand or beaten with long poles. The latter method is discountenanced, as the fruit is thereby necessarily bruised, with disastrous consequences to the oil, and the trees themselves give a less abundant yield thereafter. This system is so expeditious, however, that in a large proportion of cases the trees are beaten and the fruit falls into sheets held beneath for the purposo. An olive tree ten years old should yield about six pounds of fresh olives, and at twice that age twice that quantity and at the age fifty years from twenty-two to twenty-six pounds.

In the south of France and Italy the crop of olives is gathered in large sheets and transported to warehouses or cellers, and there laid in beds six to eight inches in thickness. They remain for from twenty-four to forty-eight hours, until they commence to wrinkle and lose a little of their water, but not sufficiently long to permit fermentation to begin. In other countries, and particularly in Spain, the habit is general to store the fruit in piles, where it remains for from twelve to fifteen days. A black water is drawn from this mass which heats and ferments. Before the fermentation proceeds too far, a point which is decided by thermometrical test, the manufacture of the oil begins. The piles should not exceed six feet six inches in height. The extraction of oil from olives thus manipulated is easier than otherwise, as the cells containing the oil are less resistant, but the oil has a strong odor and is less desirable than that of more carefully handled fruit.

The manufacture of the oil, properly speaking, begins with the crushing of the fruit, which usually takes place in an old-fashioned mill. The crushed fruit is placed in round mats, of which twenty-two are usually placed one above the other, the weight of olives ranging about 165 pounds. The first pressure being applied for the virgin oil, the oil and water drain into tubs, the proportion being 72 per cent. of water and 28 per cent. of oil. The virgin oil is set aside, and the mats, removed from the press, are bent back and forth by hand, some of the manufacturers pouring a quart of hot water upon each mat, after which the twenty-two are placed in a hand or hydraulic press and the second pressure applied. The oil and water are drained into tubs, as with the virgin oil. The pulp remaining in the mats is removed, and by a single mechanical process, which takes place in a separator, the kernels are separated from the pulp, from which latter a third and very low grade of oil is obtained by chemical process. This process is rarely carried on by the olive growers, as it requires complicated apparatus. Both pulp and stones have a regular market price, however, and are manipulated in Marseilles on a large scale. The local cultivator occupies himself with the first and second crushings of the olive only.

The oil in the tubs, as it comes from the press is carefully skimmed and placed in barrels. After all the oil of the surface has been skimmed, apparently, the water itself is poured into stone or tile cisterns, called the "enfer," where it remains three or four months. In the course of this period a considerable quantity of oil in suspension mounts to the surface and is also skimmed off and sold as "huile d'enfer." Its odor is very strong and the price is low. The oil of the first pressing, or the virgin oil, and the oil of the second pressing are always kept separate and sold for what they are. They are decanted three or four times from one barrel to another, and finally deposited in huge earthenware jars, where they remain until spring, and are then decanted for the last time into barrels and offered for sale in the market.

The successful manufacturers and exporters of olive oil find their raw material wherever they can, having buyers who scour France, Italy, Spain and Tunis, and the success of the business hinges mainly upon the tasting capacity of the head of the house, whose work begins after the oil has been pronounced upon by chemical analysis.

The most important operation in the treatment of the crude oil is its filteration. While the various nut and seed oils are now readily freed of the mangarin in suspension by subjection to a low temperature, this process cannot be successfully followed in the case of olive oil, which is a much more delicate product. Until comparatively recently the packers of olive oil filtered it through cotton, and probably the majority of packers cling to the old system mainly because of the expense of the improved paper filters. Excellent results are obtained by passing the oil through cotton, but the process is slower, and the cotton itself absorbs large quantities of the oil which cannot be expressed and used, except as an inferior product. It is now generally agreed that no more satisfactory filtering material has been found than specially prepared paper, and the oil is passed through paper either by means of force pumps, hydraulic pressure or the application of the stand-pipe principle, the pressure upon the paper depending upon the height from which the oil is injected into the apparatus.—*Bradstreet's.*

PLANTING NOTES.

Earth-nuts in Uganda, &c.—It appears that these Nuts can with ease and profit be grown in East Africa—so says the *East Africa and Uganda Mail* of a recent date. In British India 46,000 acres are under cultivation with this nut. In the native states of India over 16,000 acres are under the same culture, and this area will yield nearly 11,0,00 tons; and the journal noted is of opinion that after satisfying the home demand, sufficient would be left to pay for exportation to England and elsewhere.—*Gardeners' Chronicle*

Martinique.—The following extract from a private letter to one of our correspondents bears witness to the beauty of the stricken Island:—"The scenery of Jamaica and Cuba cannot be compared with that of Martinique and Dominica; my pen cannot adequately describe the beauties of Martinique, rising smartly out of the sea, and its mountains towering away up into the skies! Dominica, too, is sublimely beautiful, with its deep gorges and primeval forests. Tremors have been felt in Dominica, and a lake on the top of a mountain is said to have gone dry, so that they are evidently within the seismic sphere of disturbance."—Ibid.

Doryanthes as a Food for Pigs.—According to the *Agricultural Gazette of New South Wales*, the Giant "Lily" (Doryanthes excelsa) has been suggested as a useful food for pigs. Analyses have been made of the bulbs of the plant (here so prized, but in the upper Mangrove district growing wild), to see if it would be valuable for fodder when other foods are scarce. It is considered that the bulbs compare very favourably as to feeding values with ordinary root crops, and that, provided they are found palatable, they should prove fairly nourishing; superior, indeed, in this respect to Parsnips, Beets, and Turnips. But New South Wales swine do not consider the Lily-Bulbs eatable when raw, but prefer them boiled and mixed with a few handfuls of ground Maize. So served "the pigs consume the mixture greedily."—Ibid.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

RECENT EXPERIMENTS ON THE CULTIVATION OF TOBACCO.

The tobacco indnstry has become so highly specialised that it is necessary for the successful planter to become thoroughly acquainted with the scientific side of the processes involved in the cnltilvation and fermentation of this material. The qualities of the tobacco leaf as regards the size, shape, thickness, flavour and aroma, the grain and general appearance, are so easily inflnenced, and so difficnlt to control, that its cultivation in new localities can only be attended with snccess after much experimental work.

At the present time experiments are being nndertaken in Ireland, on the culture of tobacco, by the Department of Agriculure. Some useful information on this subject is contained in Report No. 63 of the United States Department of Agriculture, and the following summary is compiled from this source. The report is a review of the experimental work condncted for somo years past at agricultural experiment stations situated in widely separated localities, and is intended to throw light upon the varions problems connected with the growth and cultivation of tobacco.

Methods of growing plants in seed beds.—At the Alabama State station various methods of staitiug tobacco seed were compared. Seeds were started in several beds, some open and others covered with cheese cloth. During the first year of the experiments the greater number of plants in the open beds were desstroyed by a spell of cold weather, and dnring the second season they were injured by the flea beetle. In the covered beds the plants came up well, grew rapidly and were not snbject to insect attacks. From these results it is evident that nnder the climatic conditions of Alabama yonng tobacco plants are readily affected by low temperatures, and quickly killed by frosty weather. At the Colorado staition, in pnrsuing this work it was found that it took no longer to produce plants suitable for setting ont by growing seeds in cold frames than by the use of the hotbed.

The following method of germinating the seed at the Georgia station proved very successful. The seeds were placed in wine glasses and soaked in water for half-au-hour, the water was then ponred off,—the glasses placed in saucers containing water, and a tumbler inverted over each glass so as to confine the moistened seed in a damp atmosphere. In about a week, when the seed had started to germinate it was sown in a cold frame, and with in a month from that time plants suitable for transplanting to the fields were obtained.

In the experiments conducted at the Central Experimental Farm, Canada, the seeds were sown in hotbeds, and some of the plants thus obtained were transplanted to cold frames before being set out in the fields. A striking difference was noticed between the plants set out from the hotbeds and those transplanted to the oold frames prior to setting ont. The latter were stronger and grew more rapidly than those taken direct from the hotbeds. It was also fonnd that if the plants were transplanted to a second hotbed before setting them ont in the fields, the vigonr was increased and the number lost in transplanting was materially reduced.

In the districts where fnngoid diseases gave any serious trouble it was fonnd quite possible to sterilise the soil nsed for the plant bed. Boiling water, hot stones, or steam under high pressnre may be nsed for tbis purpose.

The size, weight, and condition of ripeness of the seed, as well as the method of planting, has been shown to have an important bearing upon the crop.

Varieties of Tobacco.—At Calhonn, the North Louisiana station—ten varieties of tobacco, namely, Conqueror, Hester, Long-leaf Gooch, Ragland Improved

Sweet Oronoko, White Burley, Comstock Spanish, Persian Rose, Improved Havana and Brazilian American, were tested. Of these Comstock Spanish, Persian Rose, Improved Havana and Brazilian American, are cigar-leaf, and the rest aro described as bright-leaf varieties. The last-named, with tho exception of White Burley, produced a leaf which, when cured, was of a lemou yellow colour; they were more snccessful than the cigar-leaf varieties which, when cured, produced leaves too bright and in but small quantity.

It was also shown that Conqueror, Long-leaf Gooch, Hester, Oronoko, and Ragland Improved, cured brighter than other bright-leaf varieties, and that Vuelta de Abajo, Havana, Seed-leaf, Imported Havana, Choice Havana, Little Dutch, and Pumpelly, produced a leaf of greater silkiness and finer texture than other cigar varieties tested.

The kind of tobacco which can be grown in any district depends partly npon the climatic conditions and also upon tho character of the soil. In testing varieties, therefore, consideration should in the first place be given to the type of tobacco adapted to the locality, to the soil, and the grade which the climatic conditions and soil may reasonably be expected to produce.

Influence of distance in Planting.—A study of the relation of distance of planting to yield and thickness of leaf, was mane at the Wisconsin station. Plants were set 20 inches apart in rows 31 and 36 apart, and at intervals of 24 inches in rows 42 inches apart; close planting was found to increase the yield, and the plants nearest together in the row produced a thinner leaf than those further apart; but lessening the distance between the rows did not have this effect. A distance of 31 inches between the rows was sufficient for the fnll development of the plants. The surface area of the cured leaves per pound from the closest planting was 42·01 square feet, and from the widest planting 40·86 square feet.

Other experiments made with a view to ascertain to what extent close planting may be advantageously practised, showed that planting 1 foot apart in the row was not too close for Wilson Hybrid, the variety grown in this experiment. From these and other experiments it was concluded that too close planting interferes with the development of the leaves, while too large spaces between plants tend to prodnce coarse leaves. The dimensions of the leaf, thickness, elasticity, and size of the vines may all be more or less modified hy giving the plants space or increasing the number in a row.

Fertiliser Experiments.—The results of experiments at Kentucky indicated that potassium, chloride, and snlphate, gave equally good results as fertilisers for tobacco, and that sodium nitrate produced a better quality leaf than other forms of nitrogen.

Tests witb complete fertiliser applications were also made. A yield of 1,460 lb. of cured leaf per acre was obtained after an application of 80 lb. of sodium nitrate, 80 lb. of dried blood, 160 lb. potassinm chloride, and 140 lb. of donble superphosphate per acre, whereas by doubling the quantity of fertiliser the yield of leaf was increased to 1,620 lb.

Fertilisers used on soil in a good state of fertility, were found to increase the yield of tobacco considerably, and potassium chloride proved more efficient than the carbonates of potassium and magnesinm.

At Calhoun experiments were condncted on red saudy and grey sandy soils- and it was shown that potash had little or no effect ou the crop, but nitrogen, either in the form of sodium nitrate, ammonium snlphate, cotton-seed meal, or dried blood, caused a marked increase in the quantity obtained. An application consisting of cotton-seed meal, acid phosphate, and sulphate of potassinm prodnce the best quality leaf.

The effects of different fertilisers on tobacco were studied at the Virginia station. Five plots manure with complete fertilisers, all of the samo cost per acre,

were compared with an unmanured plot. Dried blood gave the largest yield and the best financial returns as a source of nitrogen. The tobaoco grown without fertiliscrs ripened ten days to two weeks later than that grown with fertilisers.

Influence of Time of Harvesting.—These experiments were underdaken at the Wisconsin Station to determine whether the tohacco leaf increased in size and thickness, and whether the loss in curing diminishes, when the plants are allowed to stand a considerable time after topping.

The results showed that when the plants were permitted to stand 32 days, as against others allowed to stand only 18 days, the thickness and dry matter of the leaf tended to increase, and the yield has a like tendency, *i.e.*, after curing, a greater weight of the leaf was obtained, but the area per pound of leaf was less.

It was thus possible to vary the commercial grade, and influence the price considerably, hy harvesting the crop at different stages of maturity. This was one of the methods by which the quality of tobacco might he sensibly cotrolled.

Effect of Priming Tobacco Plants.—Primiug, which consists in removing the leaves from the stalk of the plant as they mature, has a marked effect on the growth and chemical compositiou of the upper leaves. The removal of the lower leaves causes an increase of growth in the upper, and also a higher percentage of nitrogenous matter and nicotine. Priming is believed by many practical growers to he the proper method of harvesting the cigar-and cigarette-types, for in this way the leaves are uniformly matured and the suhsequent product is consequently of a more uniform character. The priming of tobacco is more expensive than cutting the stalk, as more labour is required, but the improvement in quality fully warrants this additional cost.

Experiments in Topping Tobacco were conducted at the Central Experimental Farm at Ottawa, Canada, in order to determine how the time of topping, and the number of leaves left on the plants, affect the yield. The plants were topped July 20th and 26th and August 2nd, and on each date one plot was cut back to nine leaves and another to eleven leaves per plant. The larger yields were obtained from the latest topping, and the greater uumber of leaves per plant. The time and manner of topping has a great influence upon the character of the leaf produce. As a ru'e the earlier a plaut is topped and the lower it is cut, the heavier, richer and darker-coloured the leaves become. This is a decided advantage for some crops, but a disadvantage to others.

Disease of Tobacco.—The disease to which most attention has been given manifest themselves during the curing process, and are commonly known as 'stem rot" and "pole hurn" or "pole sweat." The latter makes its appearance as small dark spots on the surface of the leaf near the veins and midrih, where moisture is most abuudant. The disease is supposed to be primarily due to a fungoid growth which attacks the leaf on the surface and gives access to a hacterial process of decay by disiutegrating and partially destroying the leaf tissue. It has been ascertained that moisture and temperature have a marked effect on the activity of these organisms. Decreasing the amount of moisture lowered their vitality, and a temperature up to 70° F. or even 90° F. favoured their development, while a temperature of over 100° or 110° F. and below 35° or 40° F. temporarily or permanently checked their vitality.

From investigations it was concluded that under the atmospheric conditions most favonrable to the development of "pole sweat" the temperature and moisture in the interior of a closed barn could be regulated by artifiicial heat so as to reduce to a minimum the liability of tobacco to damage from fungi or other like organisms.

"Stem rot" is a fungoid disease which frequently affects the stems of the plants in the last stage of curing. No special experiments were made upon this disease, hut as a remedial measure it was suggested that when the crop is cnred all stems and refuse attacked hy stem rot be burned before the fungus has matured, and the barn fumigated with sulphur immediately after curing, and again hefore the harvesting of the next season's crop.

Experiments in curing Tobacco.—Tobacco goes through certain proccsses of fermentation from the time it is cut until it is ready for the manufacturer. During this time it is said to be curing aud ageing, After the harvest the leaves are speared upon laths and hung in a barn to dry, Artificial heat is often employed for this purpose. Experiments with different methods of curing tobacco have been conducted at several experimental stations. At the North Carolina statiou, the ordinary method of cutting down the plant and curing it with the leaves on the stalk proved less profitable than curing by the Snow process, in which the leaves are cut from the stalk as they ripen, and cured separately. A greater yield was obtained with the tobacco cured by the leaf process and the quality was better. This effect is ascribed to harvesting the leaves as they became mature, while, by the stalk process, many of the lower leaves were over-ripe, and the upper leaves still green at the time of cutting. It was found that the time and temperature required for curing leaves from different parts of ibe plant varied according to their ripeuess, and for this reason the leaf-curing provided the most desirable method, as the leaves were all of the samc degree of maturity. At Wisconsin it was found that the loss of water in curing was about 71 per cent. of the weight of green leaf.

It is stated that the changes in the colour of the leaf during the curing process were not directly due to the loss of moisture, hut depended largely npon the degree of ripeness—the riper the leaf, the lighter in colour it would be when cured.

From data obtained in this work it was coucluded that tobacco should he cured in as moist an atmosphere as possible, without incurring damage from "pole burn." A temperature within the curing house not exceeding 75° F., and a degree of humidity among the plants represented by a wet bulb depression of 2°, were regarded as suitahle conditions. In order to maintain these requirements. the plants should he eveuly distributed in the curing-house, in order to equalise the humidity of the building, and the ventilation should be under perfect control, with a provisiou to regulate the humidity of the air by the use of artificial heat.

Fermentation of Tobacco.—The fermentation or sweating of tobacco is carried out in several ways. To give a general idea of the method of procedure, that followed in Florida may be cited. After the tobacco is cured, the leaves are stripped from the stalk and made up into hands, *i.e.*, bundles tied together at the base. These hands are either piled on the floor or put into bins, and the fermentation allowed to proceed gradually. The temperature of the pile gradually rises, until it reaches its maximum, which is sometimes as high as 180° F. From this point the temperature gradually subsides, aud finally attains the normal temperature of the room.

In connection with the changes which take place during the process of fermentation, most attention has hieherto heen given to the loss in weight of the leaves and to the chemical changes which occur. At Connecticut State station the weight and chemical composition of cured and fermeuted leaves was compared. The loss in the fermentation of upper leaves, short seconds, and first wrappers was 9·7, 12·3 and 9·1 per cent. respectively. About three-fourths of the loss in the short seconds consisted of water, the upper leaves, lost almost the same proportion in dry matter, and in the first warppers the loss of dry matter was a little less than that of water.

The nitric acid, ammonia, fibre and starch contents of the leaves were affected very little by the process of fermentation, and the chief loss of dry matter was found to have occurred in the nicotine, albuminoids,

and amide bodies, nitrogen, free extract and ether extract. At the Pennsylvania station it was found that the loss in fermentation was greater with tobacco fertilised with barnyard manure than with tobacco grown with other fertilisers.

When it is considered that, commercially, tobacco is divided into four classes, viz.: cigar, cigarette, snuff and export, it becomes evident that the systematic observations as briefly described are invaluable to growers, who must, of necessity, produce tobacco suitable to the requirements of the market.—*Imperial Institute Journal.*

COFFEE CULTIVATION IN INDIA.

REPORT ON THE LEEMING QUESTION.

The following report on the "Leeming System" of coffee cultivation was supplied to Messrs. H. J. Gardiner and Co., Loubon, by Messrs. Binny and Co., Madras:—

Messrs. Binny and Co., Madras.

Dear Sirs,—As requested by you in your letter of the 9th instant I went to the Shevaroy Hills and visited Scotforth, Mr. Leeming's estate, on the 12th and Kooderay Panjan Estate, of which he is manager, on the following day, and beg to report as follows:—

The system of cultivation carried out on these properties has, for the sake of convenience, been called the Leeming system, but Mr Leeming does not claim to have discovered anything new. He says he has merely thought out and applied to coffee growing the principles carried out by practical and scientific growers of fruit trees in various parts of the world, and his system as it stands at present, is the result of careful observation and experiment carried on over several years. I was taken over every field in these two estates, so that I might see for myself the effect of the sysrem on both the good and poor soils, Mr. Leeming answering all my questions without any reserve whatever.

The system may be said to have been instituted seven years ago, when he ceased to either prune or handle and allowed suckers to grow, the trees being left to nature, but he continued to cultivate and manure the soil more carefully than ever. The result was that his crops increased and his trees suffered less from leaf disease; but it was apparent that they were so crowded that they could not give nearly as good crops as they might. In 1896—only three years ago—he began cutting out in field No. 10 of Scotforth reducing the number of trees from 27,000 to 13,500, just half, and giving them a space of 12 by 12 feet in which to spread, i.e., about 600 trees per acre. 1899-1900 he picked 1,500 struck bushels of ripe cherry from this field, equal to nearly 7 cwts. per acre. Last season he picked 1,700 bushels, nearly a ton more than in the previous year, and in April, again, he thinned out the field to 10,200 trees, and the estimate for the coming crop is nearly 10 cwts. per acre. These figures I took from the estate books myself, and are unquestionable, and a better record than this can hardly be imagined. The other fields were similarly treated in 1899 and 1900, and now his object is to finally get about 300 trees per acre, and no more. In field No. 3 of Scotforth this has been done.

No sooner had the trees got root and air space than they at once began to fill out laterally, and the long branches came sweeping down to the ground, thereby increasing the bearing area enormously, and suckers grew very slowly. What suckers there are were grown before the thinning-out process began. These trees are now 10 to 12 feet higher, and the branches have a spread of over 15 feet, and I agree with Mr. Leeming in thinking it will take another five years to see them at their full development. I merely give the figures of field No. 10 because it was the first to be cut out, but those relating to the other portions are equally good. When thinning out from 600 to 700 trees per acre, he first cut off the primaries, leaving the suckers for a couple of years, thus giving air and some root space to the trees that remain, but he is not certain that it would not pay better to take them out at once.

When going over Kooderay Panjan, he took the same trouble in order that I might see part of each field. I remember seeing this estate some eight or nine years ago, when, although it grew very fine oranges and silver oaks, the coffee was very poor indeed; now, under this system, there is a complete transformation, oranges, etc., have disappeared, and the avenue of great coffee shrubs, healthy and vigorous, with dark glossy leaves and laden with crop, have taken their place. When Mr. Leeming took charge of it, eight years ago, its crop was 1½ ton off 65 acres; last year, off the same area, with some little assistance from the young coffee, he picked 25 tons. For seven years he never pruned, and in 1899 he cut out to 600 trees per acre, and there is a good deal of it now thinned to 300 trees per acre. The coming crop is estimated at 11 tons, and, judging from the wood now making, it should easily be followed by 30 tons. The way trees that were a mass of sticks from overbearing, both here and at Scotforth, are making new wood is simply marvellous.

The new clearings on both estates are planted 7 by 7 and 8 by 8 feet apart, and beyond topping the trees that are intended to be permanent, they have never been touched with a knife. Those trees that are to be cut eventually will have their primaries cut off, and a crop or two taken from the suckers. I have never seen finer clearings, soil, climate, and deep cultivation being all in their favour.

Regarding cultivation, Mr. Leeming believes in deep drains (3 to 4 feet deep) and 40 feet apart to enable those large trees to send their feeding roots deep into the soil, a six-inch digging with a quintanies once a year and ¾ lbs. bone meal, poonac, and nitrate of potash scattered over the surface and dibbled in. The supervision of applying the manure has been very greatly simplified under the new system, and each individual tree can be studied. and manured according to its needs. He is also growing a legume (a creeping pea) in the middle of the row, one to each tree, which, when growing, will cover the ground and act as a mulch in preventing wash and loss of moisture, and induce the earthworms to come up and make casts. I was shown examples of these casts as we went along. Just before flowering the legumes will be dug into the soil, and will enrich it with a cheap store of nitrogen. He very kindly gave me a supply of the beans to try in our district.

The advantages of the Leeming system, as compared with our present methods, are: Economy, in that no pruning or handling are required, and only half the quantity of manure is necessary (Mr. Leeming believes in manuring at least once a year; improved quantity of bean, as leaf disease is not nearly so virulent now that none of the leaves, which are the lungs of the tree, are sacrificed in pruning, and the crops are not only more regular. but are much better. These large trees are not nearly so easily affected by a bad blossoming season, although they will always do best in a good one. Mr. Leeming's figures speak for themselves, the results are, as Mr. Hodgson remarked at the Conference of the U.P.A.S.I. simply astounding Whether we in Mysore are ever likely to achieve such results is doubtful, as the Shevaroys are, generally speaking, much more favourably situated as regards soil, climate, and rainfall. but even if we only receive a third of Mr. Leeming's success, we will improve our position enormously.

The system has been objected to on the score of borer, but I find Mr. Leeming has had worse borer than we ever get, and yet he has no fears on that score. He says it is only destructive on the clearings, and that old trees are rarely attacked, as the branches are close and come down to the ground, thus protecting the stem, and this is borne out by the fact that those trees that have suffered have been brode near the top, when the damage amounts to very little. It has been alleged that if trees are neither pruned nor handled they will lose their primaries,

SOME NOTES ON RUBBER GROWING.

SOME VALUABLE POINTS.

The following notes are written by a gentleman at present in the island who from his long experience in the handling of rubber in all its forms is entitled to be considered somewhat of an authority upon the subject:—

The continued increase in the price of the raw India rubber has naturally turned the attention of both planters and manufacturers to the extention of our existing rubber supplies. The ever-increasing demand for the manufactured article, its ever-widening field of application, the new and great demand not only for rubber tyres, but also for road vehicles, and the thousand and one applications of the manufactured material for mechanical purposes, had all so increased the demand for the raw gum, that the world's supply barely met the necessities of the demand, consequently the cost of the raw material had advanced to famine prices. Para, the standard brands had advanced from its normal price, viz., 3s. per lb. to 4s. 6d., an increase that left the manufacturer poor indeed, and the producer rich beyond all telling. This increased demand not only then, but also now, promises to be permanent and to expand still more, rubber cab and cycle tyres have come to stay; the advent of the motor car has also added to the demand. The climatic conditions of Ceylon, its temperature, its heavy rainfall, the character of its soil, all pointed to this island as being an extremely good, if not an ideal, rubber-producing country, the plantations both at Henaratgoda and Edangoda, where the Hevea Braziliensis so successfully flourishes, proved that the merely experimental stage had been safely passed; a loamy soil, with a heavy rainfall, a country not too liable to flooding, plenty of moisture in the atmosphere not too much around the roots, at any elevation up to 1,500 ft., had already proved to yield satisfactory results. Cheap and plentiful labour held out a reasonable prospect of many coolies becoming fairly intelligent in rubber collection, if properly trained. In brief, the promise of Ceylon as a rubber-producing country to the visitor versed in rubber culture was distinctly favourable, perhaps this opinion was influenced and biased by the lovely climate, by the good nature of the people, and, perhaps too, by the beauty of the natural scenery.

THE FINEST RUBBER.

Far and away the finest rubber is derived from the Hevea Braziliensis, it is hardly worth while now to experiment with any other variety, the same care and attention given to the Hevea will produce a far better gum, stronger in fibre and possessing a much higher breaking strain than any other, and for this reason it will command higher prices than the products of either the Syphonica or Ceara. The seeds of trees now in the island are derived from plants sent hither from Kew in 1876, and although these still produce excellent results it is certainly worth the experiment to introduce a fresh stock direct from Manaos on the Amazon, the native home and habitat of the true Hevea Braziliensis. Reliable agents there are of opinion that the seeds can be safely sent to Ceylon if in proper and specially made germinating cases, and if this experiment proved successful Ceylon would be in possession of a new stock, the development of which it would be interesting to note side by side with the existing growth. The growing requires but little care. Rough weeding is quite sufficient. Upon the tapping of the trees at say eight to ten years old, and subsequent curing of the milk the success of the crop absolutely and solely depends, and upon this first crop also depends the reputation and future prosperity of the estate from which it is exported. A new brand placed upon the market immediately attracts the attention of the manufacturer. He is quick to secure a portion, and test a new rubber to discover if perchance there be "any good thing" in it. Happy is the new rubber which has no history. It is received eagerly, put upon its trial with every wish to make the best of it. If this test is satisfactory future success promises well, if unsatisfactory the shadow of suspicion and the coolness of neglect will for a time at least hang over that estate. To secure a good result from the first collection, it would be advisable to import two or three experienced collectors from the Amazon—not a costly enterprise; and where several planters are interested and prepared to combine, the expenses may be shared, and the more intelligent of the coolies on the interested estates duly instructed in their work. This policy was adopted by the Belgian Government on the higher reaches of the Congo, and here these Amazon experts succeeded in extracting from the African indigenous Hevea, by careful extraction and curing, a rubber called *Ruki* (after an adjacent village), which is actually better than Para itself, with a lower pecentage of rubber resins, and a lower percentage of foreign matter, thus offering a higher tensile strain. Naturally, this secured a better price in the European markets than Para itself, and is in great demand. This care, of course, is the ambition and goal of every grower. The same course was adopted by the Liberian Government in reference to the rubber trees near Monrovia, and at first it exported some excellent samples, truely capable of improvement; but, upon the departure of the rubber experts, the native Krew boys, either from want of care, or pure and simple laziness, abandoned due care, and consequently, Liberian rubbers are to-day more or less under a cloud in the market. The first and greatest care necessary and even imperative,

IS ABSOLUTE CLEANLINESS IN THE EXTRACTION

of the milk: the bark of the tree to be tapped should be carefully cleansed, the knife to be used carefully cleaned, the V shaped cuts and perpendicular central channel all should be perfectly clean before the milk is allowed to run, the collecting cups and milk can also need attention in this respect. The necessity of this seemingly excessive care is clear, in view of the fact that oftentimes the smallest particle of grit present may cause endless trouble to the manufacturer, depreciating or destroying the quality of his work. The manufacturer, to start with, must have his raw rubber perfectly pure. To this end the imported gum is first of all heated, then torn and rolled between friction rollers, under a stream of water to remove the foreign matter that may have been introduced through the carelessness of the collector. This constant tearing and rolling necessarily reduces the original strength of the gum, the greater the proportion of foreign matter to be removed, the greater the percentage of the loss of tenacity of the material. For instance, the removal from firm Para rubber, of even 5 per cent. of impurity, will oftentimes occasion the loss of 20 per cent. in strength and vitality of the resulting product. It is oftentimes the one little grain of sand which does the greatest mischief. As an illustration, may we take the case of a cycle tyre inner tube. If a little grain of sand is allowed to get into the milk in collecting, these little particles are the most difficult to remove mechanically by washing, hence the grain of sand eventually finds itself embedded in the thin skin of the cycle tube. Upon inflation the grain of sand pops out leaving a point of least resistance. Subsequent inflations tend to form a bubble, in a few days the bubble bursts; the sand has done its work, and the tube requires mending. Manufacturers know this to their cost, and are therefore willing to pay highly for a perfectly clean reliable rubber, and look with suspicion of either "gritty rubber" or "barky rubber." In the latter case the embedded fragments of bark or vegetable matter being very difficult to remove from the gum, become charred or carbonized during the process of vulcanization at a temperature of 280° F. and then simply drop from the article as so much soot. These foregoing remarks refer to what one may regard as accidental impurities due to want of cleanliness or absence of sufficient care, but which neverthless, depreciate the value of the article from 2d. to 6d. per lb. There is, however, another form of adulteration which will in time destroy

the reputation of any brand, and effectually "boycott" from the markets the estate sending it. This is the designed admixture of inferior gums, such as *Euphrobia* gum and many others of the resin class to reduce the price and illegitimately to increase the meantime profit, but to court disaster, and discredit the market of the future. For example, some six years ago, Borneo produced a fair rubber promising with increased care and experience better things. The producers in their haste to be rich, introduced "potato gum" into the milk; and down to the present time the class of rubber is hopelessly discredited and

CONTEMPTUOUSLY SPOKEN OF AS "DEAD BORNEO."

Many other brands have met the same fate from the same cause. On the other hand, where resolute and continuous attempts have been made to improve the method of collection, such efforts have been amply rewarded. Four years ago, the poor gum of Accra, Cape Coast and Saltpond sold with difficulty at 10d. to 11d. per lb.; and now, by a process of clean collection and careful curing, the price has advanced to 2s. to 2s. 3d. per lb., at which it finds willing buyers. Perhaps the most striking illustration of this appreciation of quality is that shown by the Congo rubbers, the preparation of which is yearly steadily improving with a proportionate increase in price, moving from 1s. 3d. to 3s. 6d. per lb. The process of curing to produce the first grade rubbers also necessitates an experienced headman, so that the smoking or curing may be thorough and complete, that all the immature so may be dully coagulated into caoutchouc—here decrimination is necessary, secured by experience in order to smoke the milk thoronghly, yet not excessively. Great care in this process is necessitated by two considerations—in the first place, to be certain that all the sap is coagulated, failing which the immature juice will be lost in washing, causing perhaps the loss of 15 to 20 per cent. in weight, instead of 5 per cent., as in the case of a well-cured, clean rubber, and in the second place to secure its freedom from rubber resins. To the presence of these has been traced the cause of the rotting or hardening of vulcanized rubber, and this knowledge has led to the issue, by Sir A. M. Rendel, of a rigid specification on behalf of the Government, refusing to pass any rubber article found to contain more than 5 per cent. of rubber resins. This official specification is being rapidly adopted by the Indian Government, and by the principal engineers, and will, in a few months, become the recognized standard for a good rubber. If Ceylon rubber is to command a good place in the market, *it must meet this requirement*; otherwise the product will be relegated to a third class group, looked upon with suspicion and priced at "rubbish heap" rates. Recently some experiments have been made by prof, Heinrique, to effect the removal of these resins by chemical treament, with alcoholic soda. Good results are predicted, but the practical results of time, sunlight and heat upon the manufactured article must be awaited before any reliable opininon can be formed as to the value of this chemical process, and also of its cost upon a commercial scale.

IN CEYLON'S OWN HANDS.

It is proven that the soil, climate, and rainfall of Ceylon are all alike favourable to this new industry, but it now depends upon the care, the attention, the intelligence of the planter, in view of the considerations herebefore mentioned, as to whether Ceylon rubbers are to command a high place in the markets of the world, securing profit to the planter and reputation to this colony, or to become one more addition to the role of discredited and unreliable products.—Local Times.

NEWS AND VIEWS FROM MANAOS.

(To the Editor of the *India Rubber World.*)

The Brazilian nut crop now being over, the landholders are turning their attention to the rubber crop for the coming season, and already large shipments of goods have been made from Manaos to the rivers Jurua Purus Japura and Madeira, and rubber is trickling in from the Enbira Tarauaca, and other affluents of the Jurua. The nut season has been very poor, as regards both quantity and price.

The production of Upriver rubber is not expected to be so large during the coming season, for many people are saying that rubber at 4 $ 500 Brazilian is not worth working. Yet the receipts are larger to date than last year at this time. The price here is equivalent to 50 and 55 cents a pound for fine, and further up it is selling at 25 to 30 cents.

As indicating the tendency to introduce modern improvements in Amazonian towns, it may interest some of the readers of the *India Rubber World* to know that an electric lighting plant has been installed at Lahrea, on the river Purus, at the point where the Ituxy joins the Purus, 692 miles from the Amazon. The plant was constructed by the C. & C. Electric Co., of New York, and is based on the Nernst lamp system. The same company will probably supply a plant for Manacapuru, in the same region. The town of Labrea is also planning to obtain a water works system.

The Indians on the river Japura have been out on the war path, burning two or three rubber stations and killing some thirty persons.

The Amazon cable is as usual broken, so that business in rubber has been done by fits and starts depending entirely on the arrival of ships bringing news of exchange rates from Para.

The greatest present need of the Amazon country is a better, quicker, and cheaper means of steamer communication with the United States.

THE CONWAY CONCESSION ON THE ACRE.

Everybody here is talking about the concession by the Bolivian government, of the Acre rubber district to the American syndicate, of which the India Rubber World has lately published acconnts. The river Acre rises in Bolivia—in which country it is called the Aquiry—but enters Brazil before discharging into the Purus, one of the largest tributaries of the Amazon. The highest point on the Acre navigable is 1,058 miles distant from the Amazon. The chief towns (they are called "cities") are Floriano Peixoto on the Brazilian section, and Puerto Acre (or Puerto Alonzo), at the boundary, in Bolivia. At the latter place in a Bolivian custom house exists and a fort is being built; a mule road is also being opened to La Paz. the capital of Bolivia. On the Brazilian Acre are rubber stations at Apuhy, Arares, Nazareth and the state revenue station at Caqueta. On the Bolivian section there are rubber stations at Flor de Ouro and at Bagaro, where Galvez, the head of the late so-called "republic of Acre," fired upon a Brazilian boat.

The dispute at one time between Bolivia and Brazil over the ownership of this territory arose from the trouble in determining the exact source of the river Javary, the division line being specified as running from that point to the mouth of the river Beni. This point having been settled, Peru now bases a claim to a portion of the Acre district, on another imaginary line, and has filed a formal protest against the validity of the concession granted to Sir Martin Conway.

That the Acre district is the richest portion of the Amazon valley, there can be no doubt, some of the *seringales* their yielding from 8 to 12 kilograms of fine rubber a day, per *estrada* of 180 trees. This is equal to 2.3 ounces per tree. Elsewhere in this paper the same writer refers to 1·5 ounces as a good average yield—[THE EDITOR]. The Caucho has been largely worked out on the Brazilian Acre, but doubtless very much still exists on the upper waters of the river.

At present the prices of goods are very high on the Acre, owing to heavy freight rates and the fact that everything must be imported. In 1900 I paid at the rate of $1 a pound for jerked beef, and

everything else in proportion. But a fairly active man could earn $8 to $12, gold, a day, at working rubber, and in sixteen days I once made $1,400 cutting Caucho on the Xapury, a branch of the Acre. But the Caucho is gone in that region, and rubber is selling at 50 cents a pound in Manaos and 15 20 cents on the Acre.

Several steamers ply between the Acre and Manaos and Para, at least two a week leaving Manaos for that river at the height of the season. The Acre is somewhat rich in minerals, coal gold quartz, and tiny emeralds having been found in various parts. S. G.

Manaos, Brazil. April 14, 1902.

CULTIVATION OF VANILLA IN GERMAN EAST AFRICA.

The current number of *Der Tropenpflanzer* (April, 1902), the organ of the German Colonial Economic Committee, contains an interesting article on this subject by Herr Blintzner, a planter who has grown vanilla in Africa, and who has had considerable experience in the preparation of this material for the European market. The object of the article is to extend the cultivation of vanilla in such German colonies as the Cameroons and Togoland, and for this purpose full information on the question of choosing suitable localities for the plantations, the artificial ripening of the pods in inclement weather and the proper packing of the commodity for export to Europe are given, and may be commended to English planters in tropical colonies where vanilla cultivation is possible.

Of the various species of plants yielding vanilla the one giving the best results is *Vanilla planifolia*, which begins to bear usually in the third year after planting and yields from 3 to 5 crops. It flowers in East Africa from August to November and bears fruit from April to July, the latter requiring about eight months to ripen in normal whether, and a further two months for drying and fermentation. For a plantation of about 10,000 plants, 15 labourers are necessary, and the wages of the latter on the East Coast of Africa are about 3½d. per day each. In forming a vanilla garden special attention should be paid to the selection of a site protected from wind shaded by trees from the direct heat of the sun, and in the neighbourhood of a stream which is not dried up in the hot weather. The importance of the latter is obvious when it is remembered that the roots of the plant only penetrate about twelve inches into the ground and, therefore, obtain water only from the easily dried surface soil. For this reason it is necessary to have a good supply of water for irrigation, in dry whether. The plants are arranged in parrellel rows about five feet apart, passages being left at intervals of about 45 to 50 yards to permit of regular inspection of the plants. As supports for the orchids poles of ebony are sufficient in situations where there is sufficient natural shade, but, if the latter is deficient, then *Jatropha curcas* may be grown in the garden to afford both shade and support. It is usually best to place the young vanilla plants for about a fortnight in a well-shaded moist situation where they are kept well watered, and then to transplant them to the small pits about twelve inches deep already prepared with leaf mould for their reception in the plantation, the aerial portion of the plant being at once secured to the support by bast or banana fibre. The orchids should not be allowed to grow higher than about 5 feet, and when they reach this stage the heads should be carefully bent towards the ground. The plants require manuring with leaf mould or similar material once a year. The chief enemies of the vanilla orchid are beetles, snails and caterpillars, which eat the fleshy roots and young stems, the only remedy being the constant examination of the plants, and destruction of these insects, when they are found. The flowering period is an important time, since the plant, outside its native habitat, is not self-fertilising, and must therefore be pollinated individually by hand. This work, although rather a delicate operation, can be readily taught to negroes. In order to secure pods of good quality it is necessary to limit the fruit production of each plant to from 20 to 25, although in special cases the maximum limit may be 35; if this number be exceeded the ripe fruits suffer in size, appearance and flavour. Ripeness of the fruits is indicated by the formation of a yellowish patch at the base, and at this point they should be gathered by breaking the attachment to the stem cautiously with the finger nail.

The operation of curing the ripe pods has an important bearing on the quality of the vanilla ultimately obtained, and great care has to be exercised in the carrying out of the drying and fermenting processes. The pods, after gathering, are sorted on the following day into about three sizes, and placed in large pots warmed to about 80° C by hot water for about 14 seconds, then packed in wool-lined boxes for a day, and finally dried with a linen cloth and placed in the sun on wool-lined trays for complete desiccation. In wet weather the exposure to the sun is dispensed with and the final drying accomplished by careful heating in ovens kept at temperatures between 80° and 100° C. The prepared pods are then stored in drying rooms and finally in large metal-lined boxes.

The preparation of the finished vanilla for the market, consists in sorting it into various qualities according to its appearance, size of pods and flavour. The pods of the same quality are then tied into bundles of about 50 to 60 each, secured with fine twine and packed into well-closed zinc-or parchment-lined boxes, capable of holding from 10 to 12 lb. of the product.—*Imperial Institute Journal.*

WATERING YOUNG TREES AND SHRUBS.

Amateur gardeners as a rule do not understand the art of watering in dry weather. When they see that the flowers and shrubs are drooping, they attach a hose to a stand pipe and thoroughly wet the—surface. They rarely think of looking to see how deep the water has penetrated, and would be astonished to find that after half-an-hour's hose play the soil is only wetted to the depth of less than a quarter of an inch. Such watering is worse than useless. Far better to mulch the soil, and trust to that for the preservation of moisture than to form a thin layer of damp soil, which only attracts the roots upwards to it that they may be par-boiled by the hot morning sun.

A good way to water shrubs is one which we adopted with perfect success in the case of some valuable coffee-trees during a very dry season. We took a number of beer bottles, and, with a tap of a pick on the bottom knob, drove the bottom neatly out. These bottles were then buried neck downwards close to the tree. Every night they were filled with water, which slowly drained away beneath the surface—1 foot below. The rootlets then sought the needful moisture downwards instead of upwards, and the plants grew luxuriantly. The surface was never watered, but by capillary attraction it was kept fairly moist.

In India, gardeners bury a porous jar like a water monkey unglazed. They are filled as soon as empty and a plug on the neck serves to keep out insects and dirt. If gardeners would try this plan they would save many a plant which would die under the ordinary hose treatment.—*Queensland Agricultural Journal.*

HONOUR FOR SIR JOSEPH D. HOOKER.—An official announcement in Berlin states that Sir Joseph Delton Hooker, formerly Director of the Royal Gardens, Kew, has been appointed a Foreign Knight of the Order pourle Merite for Science and Arts.—*Gardeners' Chronicle.*

GREEN TEA FOR ASIATIC MARKETS.

It is gratifying to find that my last letter on the above subject has attracted the attention of so many both in India and Ceylon. I regret however to notice that your leader criticising my remarks on the trans-frontier markets was based on more than one misconception as to my meaning. I will therefore feel much obliged if you will kindly allow me to explain and defend the position I took up regarding this once valuable trade.

You state that "so far from the making of the new style green tea being experimental in India, it is only following on the lines which proved successful in Ceylon." This may be, but why slavishly follow Ceylon at all in this matter, when India can already produce the genuine article, which proved so successful that it rapidly ousted its China rival from the great markets of Afghanistan and Central Asia? The trans-frontier markets are acknowledged to be

TOTALLY DIFFERENT FROM THE GREEN TEA MARKET OF AMERICA.

In the former we have to compete against the produce of China and in the latter that of Japan, and the mode of attack in each case must necessarily be different. It does not follow that because the Ceylon green tea suits America, which many experts still doubt, that therefore it is also the best for Afghanistan. Strange to say this is conceded in your leader, when you say, "in point of fact the American and not the Afghan market was aimed at." If this is really the case, then why is the Association trying to force the Afghan market with these new teas when the North-West can supply a tea that is already known and appreciated by all Asiatics? You further remark "that the three old districts did not make the slightest impression on the American market." But I do not believe anybody up here ever seriously tried to make any such impression, simply because there was no necessity for wasting our efforts in America, when we were receiving the highest prices in India at our very doors. The North-Western planters claim no special favours, but they do claim equitable treatment, and object to being arbitrarily brushed aside on behalf of purely Calcutta interests. The Association ostensibly exists for the benefit of the whole Indian tea industry. Why then is it promoting internal competition by artificially aiding Bengal tea against the teas of Dehra Dun, Kangra and Kumaon, the markets legitimately belonging to these districts? What would the Bengal planters say if the Association withheld its support from them in the direction of America, while it deliberately encouraged the North-West men to exploit and capture the American market? Regarding

THE ACTUAL PRODUCTION OF GREEN TEA

you say, "but we are of opinion that the expense and trouble of making green teas on the old system will always stand in the way of their being turned out in quantity." But the argument will not hold, as we have only to quote China, with its millions of pounds of green tea, every particle of which is made by hand in the old style." And nearer home, the much maligned "three old districts" also turned out between them a million or two of this very tea, and made it cheaper than the black teas of the period; and I feel assured that even now the same results could be easily produced. There is no reason why the process of "panning" should be done any longer by hand. I had not much difficulty even in the old days, in erecting a rough but workable hand apparatus by which one man did the panning of a dozen or more. Something on similar lines, adapted to steam-power would, with a few attendants, do the work of the whole factory. So we need not fear any difficulty about the cheap mechanical production of the old style green tea. What is really causing serious anxiety is the casual and airy way the inexperienced men of Bengal have decided to discard this tea for a new hybrid green which is untried and wholly unknown to the conservative Asiatic markets. I will take this opportunity of once more reiterating that genuine green tea, of a greenish hue, can easily be made without the addition of any foreign colouring matter whatsoever. But it is very probable that our Asiatic customers will insist on having a lighter green, and this can only be produced by "facing" the natural green with certain effective and harmless ingredients which cost next to nothing.

To resume our arguments. You state that "after all a style of manufacture which died out for want of support on the great markets is scarcely worth while making special efforts to revive" But it is forgotten that it was not the "style of manufacture," that caused the loss of our markets; but on the contrary, it was the extinction of these markets by the political and fiscal actions of Russia and Afghanistan that made it unprofitable to make any more green tea. Again you say, "by all means let the old tea districts revive their green tea trade with Afghanistan, but they cannot help us in America or elsewhere." I beg leave to doubt this latter assertion, but even if we allow it to pass, why should Bengal go out of its way to foist its new imitation green teas on the Afghans, when there is already a well-known and suitable article available on the spot? What would be said of our Government if in a trans-frontier war, it entirely neglected and ignored the splendid native army of the Punjab, and deferred taking active measures, till it had raised, equipped, and trained a scratch lot of raw and untried Bengalis and Cingalese for the campaign! When India first started capturing the tea markets of the world from China we

WISELY DID OUR BEST TO CLOSELY IMITATE OUR RIVAL'S TEAS

in make, colour, and even in names. The reason we triumphed in the end was because, quality for quality, we gave our customers better tea for their money. We did not, as some still seem to imagine, manufacture an entirely new kind of tea with fancy names of our own concoction. Likewise when the North-Western planters made up their minds to oust China from the trans-frontier markets, they did not waste their time and money in trying to force a wholly unknown commodity on the suspicious and extremely conservative natives. They took the more businesslike course of first obtaining approved samples of green teas from the great China entrepôts at Kabul, Kandahar, Mashed, Bokhara, and Samarkand, and then manufactured up to these qualities. And as they were not above consulting the people and meeting their wishes, they very rapidly secured a firm foothold in the desired markets. Had the Russians and Afghans not deliberately closed these markets to us, we would—long ere this—have secured the entire monopoly of tea in that direction, and could easily have defied competition from elsewhere. We lost this lucrative trade not because our teas were unsuitable, but because of the antagonism of Russia and Afghanistan, and

the indefensible supineness of our own Government, which had not the courage or the statesmanship to maintain the "open door" for our commerce. Reasoning from the above two examples, showing how we ousted China black teas from the home market and China greens from the transfrontier markets, one is forcibly obliged to come to the conclusion that our present campaign in North America would have been greatly facilitated had we imitated and improved upon the Japan teas now supplied there, instead of placing an entirely new product before the Americans, to which they have not in any way been previously acccustomed. It will

NOW BE NECESSARY FIRST TO EDUCATE THE YANKEE

palate and inclinations: a slow process which must produce stronger competition on the other side, and consequently greater loss of time and money to India. Whereas had we given America, quality for quality, name for name, a genuine green tea but one superior to that now supplied by Japan, it is hard to believe that our cute commercial cousins across the Atlantic would not by this time have deserted the old love for the new. The decadence of England's world-trade of late years, it is well known, has been caused principally by the Englishman's perverse and thick-headed policy of always trying to force his unsuitable manufactures down the throats of people who have been accustomed to, and want, something totally different. While on the contrary our foreign rivals, with their keener insight into human nature, take the more practical course of first consulting their customers, and then supplying just what is most suitable to each particular case, regardless of whether or not the article comes up to their own personal ideas of perfection and convenience. In my humble opinion

A SIMILAR MISTAKE IS AGAIN BEING PERPETRATED

both in America and Afghanistan with the new so-called green teas. These teas may gradually become popular on their own merits, but that is another story. As they stand, however, they are undoubtedly retarding instead of facilitating the introduction of our green teas in the above markets. I cannot help thinking that we would win over our customers more rapidly by "panning" these teas if possible, till they assumed a natural green colour: after which the same names should be used as for Japan greens in America, and China greens across the frontier, with the addition of India or Ceylon as the case may be. We have succeeded before on these lines, and there is every reason for believing we would succeed again.

If we are to make a serious attempt to revive the former green tea trade across the frontier, we must first bear in mind that there are many political issues involved, which can only be satisfactorily settled by the intervention of the Home and Indian Governments. It is therefore necessary that the Indian Tea Association, working in conjunction with the planters of the North-West, should lose no time in approaching our Government about the matter, Both Russia and Afghanistan might be persuaded to remove the difficulties in the way by a little judicious pressure on their own trade with this country. In 1888 I suggested to the Punjab Government, that if Russia would not agree to let our tea in to her territories in Central Asia on reasonable terms, the Indian Government as a set-off should put similar prohibitive duties on the import of kerosine oil from Batoum. At the time, my suggestion was received with horrified amazement by the official worshippers of the free-trade fetish; but some years later a duty was actually imposed on imported kerosine, though not sufficient to make Russia relax her restrictions on our Indian tea. There is, however, yet time to put the screw on in this direction to India's great advantage.

WITH THE PRESENT AMIR THERE SHOULD BE NO VERY GREAT DIFFICULTY

in arriving at some mutually satisfactory arrangement. But in both cases the initiatory steps must be more political than commercial, and the Association's business should be to persuade the Government to make an early move in this matter.

The North-West men, rightly or wrongly, think that the I.T.A. does not take a sufficiently broad view of the whole position. There is ample room in the world's tea markets for all sections of the Indian tea industry: but it is urged that each market should be dealt with on its own merits separately, and the most experienced men, and the most suitable tea should be told off for each particular situation. No one with any glimmerings of intelligence can be expected to believe that Calcutta tea and Calcutta men are the only possible means of opening every new market that appears on the horizon. Yet some such idea seems to prevail down Bengal way, as witness the manner things have been done regarding the trade in India, and in Persia, and now towards Afghanistan. Specialisation and decentralisation, that is, special men and special means, and delegation of authority, are the mainsprings of all modern progress. If the Association would only bear this in mind, there would be less irritation and dissatisfaction, and more combined and harmonious work done for it by the varied planting communities of this country.

J. B. LESLIE ROGERS.

Umballa, Punjab.

—*Indian Gardening and Planting*, June 12.

WHERE GREEN LEAF IS PREFERRED.

The following particulars may interest the Indian Tea Association and others concerned to revive the green tea trade with Afghanistan and Central Asia. Tea grown in China and Ceylon is most in demand in those countries. It finds its way by rail from Bombay to Peshawar, whence the bulk of the export trade goes by the Khyber or Mohmand country to the Districts beyond. The tea is most carefully packed by the Peshawar dealers in packages varying from two to four maunds, according to the transport animals to be used. The outside wrapper is of undressed leather, and thus the loads are fully protected against rain and snow. On reaching the Afghan frontier the Amir's officials levy 1 anna (Kabuli) per Kabul seer, which is equal to 8 seers Indian. This payment entitles him to an import certificate, which he has to produce at the place where he ultimately disposes of his tea. Up to and including Kabul this terminal charge is R5-1-6 (Kabuli) per Kabul seer. The total dues thus levied before the consumer is reached amount to about 2½ annas per pound, English. If the tea is carried through Kabul to the Oxus, for the Central Asian markets, the further charges are about the same, while the Russian fiscal duties in their Asiatic territory are practically prohibitive. The Indian planter, therefore, can scarcely hope for more than a re-entry into Afghanistan; he must consider the Central Asian khanates closer to him, We may

mention that Indian hill tea is not in favour in Kabul circles, where the upper classes are great tea-drinkers. The product of Assam and Kangra Valley are considered too heating, and the green-leaf from China is preferred. It is, by the way, a mistake to suppose that the tribesmen of Afghanistan consume great quantities of tea. They are much too poor to be able to afford the beverage. In the big towns and bazaars tea is commonly drunk by well-to-do people; while traders and caravan men also use it freely. If the Punjab and the North-West Frontier Province were properly exploited, they would offer a much better market for Indian tea than can ever be secured in Afghanistan.—*Pioneer*, June 14,

THE INDIAN RESTRICTION OF OUTPUT CIRCULAR.

The following resolutions were unanimously agreed to at a meeting held at the offices of Messrs James Finlay & Co., London, on 26th May, 1902:—

(1) That those present agree to recommend and to use their influence to stop manufacture of tea from 1st to 21st August inclusive.

2 That if sufficient support is obtained, say to the extent of 65 per cent. of the crop, or 118,000,000 lbs. of tea, the Ceylon growers shall be approached to stop manufacture for a period of three weeks; and provided growers representing 50 per cent. of the Ceylon crop—or, say a total of 72,000,000 lbs. of tea—agree, the scheme shall forthwith be given effect to.

(3) That importers signing shall not alter, in the direction of coarser plucking, their present instructions to managers.

(4) That all signatories shall submit the totals of their estimates for the present season's crop, and at the end of the season will also submit the total figures of their actual crop.

(5) That the following gentlemen be appointed as a Committee to carry out the above, and to consider other steps that may be beneficial to the combination:—W H Verner, R B Magor, J N Stuart, C C McLeod, and A Bryans.

CEYLON TEA COMPANIES REVIEWED.

ADDITIONAL PARTICULARS.

We have to thank the secretaries of the undermentioned Companies for supplying the supplementary information required to complete our statistics, and which we now print for reference purposes. The acreage in bearing of the Burnside and Highland companies in 1901 was the same as in the previous year at 1,134 and 617 acres respectively, and the Kelani Valley Company showed an increase of ten acres only to 1,222, but the Poonagalla and Portmore undertakings had 1,280 and 522 acres against 1,237 and 480 acres in 1900, and on the other hand the Ederapolla reduced its acreage by 53 acres to 1,336 acres. As regards two companies, of which the particulars of prices obtained were omitted, the Panawal should have been classed with those showing an improvement as the average rose from 5½d. in 1900 to 6d. per lb. in 1901, but the Nahalma was less fortunate than its companion, and realised only 4½d. compared with 5¼d. a year ago.—*Investors' Review*, May 31st.

THE HANKOW TEA TRADE.

NO DIRECT SHIPMENTS TO THE UNITED KINGDOM.

The following details in regard to the tea trade at Hankow last year, contained in the report of the British Consul at Hankow just issued, will be interesting not only to tea dealers generally but to investors in Indian and Ceylon tea companies:—

The local supplies of Hankow teas during the season were 531,389 half-chests against 698,897 half chests in 1900, and the settlements 479,587 half-chests, against 677,738 half-chests. For Kewkiang teas the settlements were 180,620 half-chests, against 210,228 last season. Shipments to Shanghai on native account amounted to 62,687 half-chests against 34,668 in 1900. There were, as in 1899 and 1900, no direct shipments to the United Kingdom. The subjoined table shows that the demand in the United Kingdom continues to fall as it does for Russia direct, while shipments to Russia *via* the northern ports only slightly recovered from the collapse of the previous year; but the supplies for Canada and America doubled last year in fear of extra taxation, show a satisfactory increase on former figures. A certain amount of tea goes up the Han River for Mongolia and Siberia. This year the supply of leaf, brick, stalk and dust totalled only 6,870,800 lb against 7,300,000 and 11,860,00 lb in 1899 and 1900; the value is returned at £160,775:—

	Quantity,		
Destination.	1901.	1900.	1889.
	lb.	lb.	lb.
Great Britain	6,324,991	8,271,788	16,141,506
Russia	24,828,088	35,447,580	25,940.112
Tientsin and North	7,517,219	6.905,756	23,889,948
America and Canada	6,794,396	10,583,182	5,264,276

The market opened on 9th May, when the most atractive parcels of Khemun tea were settled at prices ranging from 40 to 55 taels per picul (say, 10d to 1s 2d per lb). Quality turned out to be quite satisfactory, and later on lower grades were in strong demand, chiefly for Russia, and very few chops remained unsold for more than a few days. Crack chops of Ningchows found buyers up to 57 taels, but though some were excellent, the majority were not superior to last season's. Hankow teas were of a good average quality, and the two Ichang crack chops were quietly taken at 58 taels. There were again no settlements at Kewkiang. The average cost laid down in London of first crop of tea, nearly the whole of which was settled before the end of May, was 9d per lb. Second crop teas began to arrive on the 16th June, The supply was very small; the tea-men, aware that the demand would be much less than usual, have made up their minds to reduce the production. Nevertheless, but for a partially unexpected demand from America, a considerable amount would have been left on the market.—*Financial Times*.

CRUDE RUBBER.

(To the Editor of the *India-Rubber and Gutta Percha Journal.*)

Dear Sir,—There is a great deal of activity going on here in rubber planting, and the Peninsula must before long be an important rubber-producing country. The soil and climate seem to be particularly suitable for the cultivation of Para (Hevea Braziliensis) and Ficus (Ficus Elastica) and, should the results equal the experiments which have been carried out from time to time, this country will afford a very profitable field for investment in this direction. Straits rubber has, I believe, a bad name, which is because it is more or less a heterogeneous collection of indigenous rubbers and saps collected by the natives, and, of course, we

planters do not wish to associate our cultivated product with this variety. Although my own estate is not yet in the p oductive stage, yet I can extract sufficient latex to make small experiments, and I read with very great interest your remarks on crude rubber. From these articles I learn that a great deal of waste occurs in the washing process in consequence of adulterants. Well, Sir, I am only anxious to turn out as pure a rubber as possible, and I am prepared to do anything in reason to accomplish this, but, being a planter, I know nothing about the manufacturing side. Since there is a process of cleaning rubber, would it not be possible to accomplish this on the estate, and so avoid paying freights on useless material, or, better still, so prepare the milk as to avoid this washing process? With scrap it is quite impossible to collect the latex in a pure state; an admixture of rubber bark and soil always results.

If you would, through the medium of your valuable paper, advise the planter what to do, you would be conferring a great benefit upon the community. I know there is a great deal of diversity in the opinions as to the best means of coagulating the latex; one is recommended alum, spirits, centrifugalisation, smoke, and various other methods—one of which is to allow coagulation to take place naturally. I was privileged last December in the company with Mr. Fox, the assistant director, Singapore Botanical Gardens, to take part in an experimental tapping of some Ficus trees (5½ years old) belonging to Mr. Tan Chay Yan, of Malaua. From 3½ imperial pints of latex were obtained 2 lb. 10 oz. of dry rubber, which was coagulated by adding water while the latex was still in the fluid state, and then boiling the mixture for about 1¼ hours in an earthenware pot. This rubber has since been valued in Mincing Lane at 2s 6d per lb., and described as "good, clean, fairly elastic, and dry." It is, of course, open to question whether the value would have been higher if some other means of coagulation had been adopted, but it would be interesting to know whether this sterilising of the latex is likely to deteriorate it in any way, as otherwise it seems to be an effective and handy method of coagulating. Some information on this point would be very useful.

I trust I am not unduly intruding upon your valuable space in asking you to insert this letter, as I think a great deal of good could be accomplished if the manufacturer and planter had some means of communicating with each other to discuss this important subject.—I remain, Dear Sir, yours faithfully, FRANCIS PEARS.

CACAO PLANTING IN SAMOA.

(*From a Planter.*)

Apia, Samoa, May 18.—It may interest you to hear that Cacao planting is being undertaken on a large scale here. The prospects are very promising, and this year's crop will probably fully justify past experiences and the predictions contained in reports already sent to you, particularly Mr. Moor's letter to you about a year ago. Our Cacao is a hybrid of Criollo and Forastero, the former largely predominating, and fetches a good price, 85s to 95s so far. I have seen many trees under 3½ years old full of young pods, and the older trees bear frequently 200-300 in a year. I shall have 500 acres planted by this time next year (170 so far) and there are numerous other smaller plantations being laid out.

CINNAMON IN LONDON.

The information to hand by the last mail helps to explain the private commercial telegram which we published three weeks ago, that at the quarterly sales of cinnamon held in London last month, prices had advanced as much as 2d. to 3d. per lb. Just as the fall at the February auctions was caused by an over supply, last year's exports of the quilled spice having exceeded 2¾ million lbs. —the highest quantity ever exported from the island—so the recovery of prices (and more !) was due to exceptionally small offerings. The May auctions are generally not very heavy—the drought of the first quarter of the year, and the festivities of the Sinhalese New Year early in April, combining to keep down the out-turn; but 433 bales represent about the smallest quantity offered, we suppose for the last 25 years. At the corresponding sale last year, 1,088 bales, or considerably more than double the offerings of this year, were brought to the hammer. And of this small quantity, only 156 bales were "worked"; but it was not these alone which shared in the gain of 2d. to 3d. per lb. While worked Firsts ran up as high as 1s. 9d., a figure we do not remember to have heard of since the early seventies, "unworked," which is a comparatively recent innovation, born of resistance to an exorbitant charge for undoing, examining and re-doing each bale, at about four times what the whole operation of sorting and baling costs here, also shared in the advance. During the ten years or so that cinnamon has been offered in the London markets as "unworked" spice—in the face of threats of boycott!—prices for Firsts have always been short of a shilling. But then it must be remembered, that the marks which dared the London monopolists were not the better marks, but those which studied quantity rather than quality. We do not think these have suffered by offering their wares without the hall-mark "worked"; but 1s. 3d. per lb. for their cinnamon is an unprecedented figure, and must rejoice the heart of shippers. Still, it would be unsafe to calculate on such prices again. They are not likely to be repeated except under very exceptional circumstances; and our counsel against over-production remains. The market for spice, which is a luxury, is necessarily a limited one; and though the statistical position was good last month, the Cinnamon that is now being hurried into the market will turn the scales.

The following is the Report on the last Sales of the leading Firm whose views we regularly quote:—

King William Street, London, May 27.

CINNAMON.—At the quarterly sales held yesterday the exceptionally small supply of 433 bales Ceylon quill was brought forward compared with 1,311 bales in February and 1,088 bales at this period in 1901. Considering the small quantity offered, competition was not brisk, except for a few small lots of "Firsts," which brought 2d to 3d per lb. advance for "worked" and "unworked."

Only 156 bales "worked" spice were offered and all sold at firm prices, to occasionally dearer, especially 8 bales Firsts A.S.G.P. which brought 2d to 3d per lb. advance,

Of 277 bales "unworked," 235 bales were cleared chiefly at ½d to 3d per lb. better for "Thirds" to "Firsts," which "Fourths" ruled about steady.

"Worked" Firsts 11d to 1s 9d; Seconds 10d to 1s 6d; Thirds 9d to 1s 5d; Fourths 7½d to 11d.

"Unworked" Firsts 7½d to 1s 3d; Seconds 6½d to 1s; Thirds 3½d to 10½d and Fourths 5d to 8½d per lb.

Chips, &c.—1,038 bags offered and 350 bags were sold in the room, a little coarse bark at 1d to 1½d. Chips up to 2¾d and quillings, &c. 5½d to 9½d per lb. No wild Cinnamon catalogued.

		1901.	1900.
Stock of Ceylon	..3.313 B against	3,442	3,644 B
,, Wild	..1,979 ,, ,,	2,725	2,606 ,,
,, Chips, &c.	..2,093 ,, ,,	3,705	5,333 ,,
,, Wild bark, &c.	..7,301 ,, ,,	8,242	8,100 ,,

The next auctions will be held 25th August.

DR. MORRIS AND VOLCANIC DUST FROM BARBADOS.

Dr. D Morris, Commissioner of the Imperial Department of Agriculture for the West Indies, has forwarded to the Royal Colonial Institute a sample of volcanic ash collected in Barbados on 7th and 8th May last.—*Daily News*, May 28th.

RUBBER IN BURMA.

The "Moulmein Advertiser" writes—The apparent or seeming ease with which India Rubber is extracted in the hill-forests above Bhamo in the Upper Province is responsible for some loose ideas on India rubber planting and cultivation, it being assumed that it is quite simple matter which looks after itself and only wants to be left alone. Those who have entered upon this kind of planting in the Malayan Peninsula are beginning to realise that rubber plantations entail a long wait for capital, and some very heavy work before actual planting can be begun. And there might be much in these 'handicaps' to account for the long complaint made some time ago against the local Government for its intention of opening out about 10,000 acres of land in the Mergui district for rubber cultivation as a Government enterprise. So far as the Amherst district is concerned, we have, we believe, a small rubber venture at Amherst of which the result is an uncertain, if it is not an unknown, quantity as yet. We have never been able to trace the origin, on the large tracts of hill country, inhabited by the Kachins and other tribes, of the widespread forests of the India-rubber-yielding trees. In those parts there is nothing to show that those forests were at any time artificially raised; and during a stay of several weeks in that part of Burma, enquiries about how those forests were preserved and continued were very disappointing. But it is quite a certainty now that rubber, when adopted as a special cultivation, is by no means the easy enterprise it looks when extracted from a forest which apparently has been planted and cared for by Nature. From some reports that have been printed and published of India Rubber Companies, we learn that their undertakings have swollen financially to very large proportions by the preliminary work that has to be done before planting is possible. * *

Under these circumstances the action of the local Government, which unfortunately has not always led where private enterprise would follow, is most commendable in having resolved to experiment in rubber planting on such a scale as would afford a reliable precedent to private companies investing large capital in developing the rubber enterprise in such parts of Burma where the soil and atmospheric conditions are favourable. The advantage of having these plantations as near as possible to a port is obvious; it avoids the heavy expenses incurred in transit. And the Mergui district is, perhaps, the most convenient, if it is favorable, district in Burma for exporting rubber, dressed ready for use. The enterprise as we have shown is so beset with heavy outlay that it would be almost impossible to expect private capital in following a lead which has been proved to have passed the initial and experimental stage; it never hesitates under these conditions, and if the local Government does not succeed in establishing the rubber enterprise firmly in Burma and thus prove its commercial value to Burma, it will have done something towards disarming opinions which are now very prevalent that the province has not been developed as it should have been under our present regime.—*Times of Burma*, June 7.

PRODUCE AND PLANTING.

At the meeting of the Tower Hill Company, Limited,

another of those large distributing companies which handles tea so profitably, Mr. T Lough, M.P., referred to the report on tea and coffee recently issued by the Board of Trade and given in our columns. The statistics given in that official document are certainly encouraging to those connected with tea in any way, but especially so to those who distribute it. As was pointed out by Mr. Lough, out of about 600,000,000 lb. exported in 1900 from the great tea-producing countries,—China, India, Ceylon, Japan and Java,—nearly half was imported by this country, this large proportion including seven-eigths of the whole Indian export, and three-quarters of the Ceylon export of tea. Notwithstanding the increase of 50 per cent in the duty on tea, which took place in March, 1900, the consumption throughout the United Kingdom continued to increase. Five years ago, in 1897, this consumption was 5·81 per head of the population, in 1898 it became 5·86, 5·98, in 1899 6·10, in 1900 and 6·17 in 1901. A large percentage of this recent increase was due to a greatly extended use of tea in Ireland. In that country the consumption was now nearly 8 lb. per head of the inhabitants, it was difficult to say precisely. This placed the United Kingdom far ahead of all European countries. The recent increase of duty had made our tea duty stand very high in proportion to that of other nations. In Belgium tea was admitted free, in Holland the duty was 2¼d per lb., in Denmark 4d, in the United States 5d, in Germany 5½d, in the United Kingdom 6d, in France 9d to 1s 5d, and in Russia from 2¾d to 1s 10d per lb. Seeing that the Empire was so deeply interested as a tea producer, it was surely to be deplored that they did not follow the example of those countries that gave the most favourable treatment of this indispensable article of diet.

The meeting of Lipton's, Limited,

on Tuesday was not quite harmonious. A reduced dividend is not conducive to excessive amiability on the part of shareholders. Only one gentleman, however, referred directly to Sir Thomas's yacht-racing proclivities as calculated to lessen his attention to business but his remarks found little endorsement among his fellow shareholders. Sir Thomas Lipton said he was very hopeful that the current year's trading would prove the turning point in the adverse market conditions from which they had suffered. He had not sold one single share since the formation of the company; in fact, he had increased his holding since the last meeting, and now owned nearly half of the total issue of each of the Ordinary and Preference shares and Debentures. The whole of the advertising outlay had been borne by Sir Thomas Lipton himself, in accordance with an arrangement made last year, in consequence of the bad condition of trade, and although the actual amount of this was not disclosed it is estimated in some quarters at about £40,000.

The balance sheet of the Co-operative Wholesale Society

for the first thirteen weeks of the present year has just been made up. The sales totaled £4,413,708, being an increase of 9 per cent on the corresponding

period of 1901. The London branch was responsible for about three-quarters of a million, and the tea and Coffee department in Leman Street, E, for £13,000. So far as the general policy of the Wholesale Society is concerned, the most significant recent development has been the purchase of two tea estates of 364 acres in Ceylon—the outcome of a deputation of two years ago, and also of the demands of Co-operators to go direct to the origin of things.

Lyons & Co.—It is not alone the distributing companies which make large profits in connection with the sale of tea. The possibilities of profit to those who run tea shops and cater for the multitude are apparently illimitable. The directors of J. Lyons and Co. have, in accordance with expectation, issued another bonanza report, in which the gross profits are shown to have expanded by over £50,000. The net result to the shareholders is a final dividend on the increased capital of 32½ per cent., as against 30 per cent., whilst they have the satisfaction of seeing a larger balance carried forward and their reserve augmented to £400,000.

The quarterly sales of Cinnamon—held last week attracted more than ordinary attention. The total number of bales passing the hammer amounted to 433, as against 1,311 bales in February last, and these consisted—with the exception of a few thirds—entirely of good and fine qualities, fair plantation being conspicuous by its absence. This fact illustrated more clearly than anything else the depression from which the trade had suffered for a considerable period and which had rendered forward business almost impossible. Even a certain few operators among shippers appear to have failed in their endeavour to find buyers of usual assortment at greatly reduced prices. Offers of 8⅜d c.i.f., we are told, had to be returned to Colombo as being too dear for our market. Evidently some consumers have unwisely allowed their stocks to run dangerously low. The trade had to purchase and was forced to concede prices which were much in excess of those accepted privately. Fine sorts realised an advance of about 2d above last sales' rates, and good fetched about 3d more than was paid in the February auctions, whereas the few fair bales of thirds found buyers at an advance of ½d per lb. The tone in the market has since been a firm one both here and in Ceylon.—*H. and C. Mail* June 6.

CEYLON ASSOCIATION LONDON.

(Report of the Executive Committee.)

[For the year 1901-1902.—To be laid before the fourteenth annual general meeting on Monday, 16th June, 1902.]

The number of members on the roll is 154. The chief business of the Association during the year has been dealt with by the Tea and Produce Committee, and the Executive Committee has had no other important business before it. In last year's report it was stated that there was an unexpended balance—£39 8s 3d—of the money raised in 1900 for providing comforts for the Ceylon Contingent serving in South Africa. Of this balance £19 17s was contributed to the cost of the dinner given to the contingent, and the remainder, £19 11s 3d has been remitted as a donation to the Planters' Benevolent Fund. The Association is much indebted to Mr. W S Bennett for a present of lantern slides with views of Ceylon, forming a valuable addition to the collection purchased in Ceylon a few years back. The slides have been much used by members for the purpose of illustrated lectures.

THE DEATH-ROLL FOR THE YEAR

includes the names of the following members:—Mr Daniel W Blyth, Mr George Smyttan Duff, Mr Donald Noble, Mr John Mackintosh Smith and Mr George T White. The connection of the two first-named with Ceylon dates back to the middle of the last century. Mr Smith and Mr Noble were well-known in the Colony at a later date as Planter and Banker respectively, while Mr White, as a leading London Tea Broker, has been a Member of the Tea and Produce Committee since its formation in 1889.—The report of the Tea and Produce Committee and the accounts for the year are, as usual, appended to this Report.

REPORT OF THE TEA AND PRODUCE COMMITTEE.

(For the year 1901-1902.)

The Committee has held nine meetings during the year.—The first business of the year was the appointment of a Sub-Committee consisting of the President, Messrs R A Bosanquet, A Brown and A Thomson, to consider and report upon the proposal for the formation of a Joint Indian and Ceylon Tea Growers' Association, in accordance with the resolution passed at the annual meeting of the Association on 24th June, 1901. The Sub-Committee, acting in concert with a Sub-Committee of the Indian Tea Association, submitted in February last an interim report, after consideration of which by your Committee the matter was referred back for further inquiry.

The question of the increase of the Tea Cess in Ceylon from 20 cents to 30 cents per 100 lb has engaged much attention. In considering this important subject the Committee had the advantage of hearing addresses by Mr P C Larkin of Toronto, Canada, and by Mr J H Renton, Ceylon Tea Commissioner on the Continent of Europe. After hearing the former a resolution was passed and forwarded to the Thirty Committee in favour of devoting to the bonus on the manufacture of Green Teas a larger proportion of the funds available.

On the question of the proposed increase of the Cess much difference of opinion was at first manifested; but in response to a circular issued in December, together with a letter from Mr. E Rosling, Chairman of the Planters' Association, appealing for support for the increase, a large majority of the replies received from tea growers in this country were favourable. An ordinance to remain in force to June, 1905, has since been passed by the Legislative Council, enacting that the Cess may be at the rate of 30 cents per 100 lb of tea exported from Ceylon.

It was mentioned in the Committee's report last year that it had been agreed to give a trial to private sales of tea, under conditions to be arranged by the various sections interested in the trade. For three months, July, August and September, private sales of Ceylon tea were held every Thursday, but sellers, finding no advantage in the system, reverted to the Tuesdays' public sales.

At the beginning of the Indian tea season the Committee for the regulation of sales resumed its operations. Your Committee was prepared to assist in these, both by supplying information as to the quantities of Ceylon tea being brought forward for sale and by a vote in aid of the expenses, but the Regulation Committee, unfortunately, failed to receive adequate support from Indian sellers and again its operations came to an end.

Several suggestions have been made to your Committee during the year by the Tea Buyers' Association (1) For the marking with the letter *R* of all packages containing tea which has been racked into fresh packages at the Custom House; (2) For the nomination of three representatives to confer with representatives of the Indian Tea Association and of the Tea Buyers' Association on certain specified matters connected with the tea trade; (3) For the re-weighing—of the ounce—of the selected average tared tea packages by the Customs authorities. The Committee has not been able to assent to any of these proposals.

There have recently been many complaints on the part of Importers of damage to Tea, by fruit

hides, &c., shipped in the same vessel. A Sub-Committee, consisting of the President, Messrs W H Anderson, R A Cameron, J B Keith and T C Owen, has been appointed to confer with the Shipowners in connection with the numerous claims arising from the damage so incurred.

A Deputation of India and Ceylon Tea Growers waited on the Chancellor of the Exchequer on 4th February, with reference to the duty of Tea entering the United Kingdom, and met with a sympathetic reception. No change has been made in the British and French duties, while in Australia Tea will in future be free. In the United States also it is probable that Tea will be freed of duty at the end of the year.

Other objects that have engaged the attention of the Committee during the year are the planting by the Indian Government of a large area in Burma with rubber trees; the rules of steamships as to claims on account of "ullaged" packages, and the more careful plucking of Tea on estates.

ACCOUNT OF RECEIPTS AND EXPENDITURE 1901-1902.

Receipts.—1901, May 23, To Balance with Messrs Smith, Payne & Smiths, £157 8s 9d; To Use of Ceylon Room, £1 1s; To Newspapers Sold, 8s 3d; To Subscriptions—Planters' Association, £60; Ceylon Chamber of Commerce, £50; Members—1899-1900, £2 2s; Members—1900-1901, £10 10s; Members—1901-1902, £134 8s; Members—1902-1903, £2 2s—£259 2s. Total £418.

Expenditure.—£1901 By Secretary's Salary, £100; By Rent, £80; By Firing, etc., £2 13s 4d; By Room for Annual Meeting, £1 11s 6d; By Book Case, £9 10s; By Office Repairs, £11 11s; By Newspapers, Books, &c., £7 19s 7d; By Printing and Stationery, £27 4s 7d; By Ceylon Contingent Fund, £39 8s 3d By Postages and Petties, £12 13s 3d; By Balance with Messrs Smith, Payne & Smiths, £125 8s 6d. Total £418.

Examined and found correct, Wm. Rollo.

London, 29th May, 1902.

ANNUAL REVIEW OF TEA TRADE.

(By Messrs W J and Henry Thomson.)

38, Mincing Lane, June.

Another season's business being completed, and London figures published for the twelve months ending 31st May we take this opportunity of reviewing the events of the year and considering the future.

Attention is at once fixed upon the contrast with record of the previous season. A year ago we were confronted by

OVER-SUPPLY AND INFERIOR CROP,

from India and Ceylon, expansion in China's export, and a serious decline in value. Now, we record reduction in the total output of British-grown tea, contraction in exports from China, and the beginning of recovery from depression. Amidst much that changes, two features are constant, viz: that the use of tea almost everything increases, and that British-Grown tea advances in favour wherever it once fairly gains a footing. What were the remedies proposed a year ago; how have they been applied; what has been the result? They were, in the first place to raise the standard of quality; in the second place, and as a consequence, to make less tea, and then to find new buyers. Smaller and better crops have been made, partly because weather checked growth of leaf, partly as the result of more careful plucking. The crops have contained less common tea, and the average value has risen, although, for reasons to which we will presently allude, all kinds have not shared in the improvement, but only those that were specially depressed. Directly or indirectly, our trade with Colonial and Foreign markets is maintained, and openings are lost for business which should be larger during the coming year. The attempt to place tea within the reach of native consumers in India is watched here with interest; the business-like way in which it is being carried out, and the progress already made, augur well for ultimate success. But when expedients, schemes and policies have been contrived, discussed and given a trial, we come back to the elemental facts that what Planters need is a better price, and that the value of tea, as of other commodities, is subject to the inexorable law of supply and demand. We said a year ago—and it will bear repetition—that producers could maintain prices at the level that pays by combining to keep supply within reasonable limits: for consumers in the aggregate, outside the producing countries, are now dependent upon India and Ceylon for the greater part of their requirements, and tea has become so necessary that its use will not be stopped by such a moderate advance as would satisfy growers and could be caused by reducing supply.

The necessity of making no more than is required is particularly felt by those at home who see the balance of power passing into the hands of buyers with large means, fertile in resource, who operate in London, Calcutta or Colombo as may suit them, and are ready by acting in concert to control the market—but are only able to do this effectually when there is too much tea; where it is, or who has it, matters not. But if the law of supply and demand prevails in the long run, markets are effected by other influences which have also to be taken into account. Tea has been too long subject to the

DEPRESSING INFLUENCE OF HEAVY DUTIES,

and the theory held by some that they are wholly paid by consumers has broken down under the practical experience of those engaged in trade. Every grower abroad, every shareholder at home, pays part of the sixpence levied here; shippers of China and Japan teas have suffered from the 10 cents' war tax in the United States, and traders all the world over are hampered by duties almost everywhere imposed as though tea were a needless luxury instead of a most nutritious and, to many, a necessary article of diet. Those who think otherwise rely upon the argument that consuption is large here than when the duty was less, and ignore the fact that the average value is much lower than when duty was fourpence, notwithstanding that over-supply is arrested and crops are of good quality. They also seem hardly to realize that when more of the buyer's capital is taken for payment of tax less of it remains for purchase of tea—which must be prejudicial to the seller, for the capital employed in a trade is not capable of indefinite expansion unless business is so profitable as to attract it, which is not the case with tea. We dwell upon this because a beneficent industry of great importance to India and Ceylon is being partly crippled by high taxation, and unless there be relief some gardens will be abandoned and native labour will cease to find employment. That the fruit of British enterprise in our Eastern Possessions should have to pay an impost of nearly £6,000,000 upon a value of £7,500,000 before it can reach consumers at home, to whom it is a necessary of life seems to be without precedent. Would such a tax upon the produce of Australian or Canadian husbandry be now agreed to?

What prospect is there of relief, and where? The Australian markets are now free: they should take more from us, and tea of higher value. The American tax will be abolished next year, an impetus given to trade, and larger imports called for, as stocks are low—an encouragement to India and Ceylon to make more uncoloured or green tea than has yet been thought of. This should be tried at once and where it can be done cheaply on gardens whose black tea does not usually command a high price. An estate that can put a crop of black on the London market at a cost of 4d per lb could lay down a crop of green tea in New York at 9 or 10 cents per lb without much risk. Such a chance may not recur for years; it should not be missed and America left dependent upon Japan and China. The probable

reduction of the German duty to 1½d per lb should also do good. But helpful as all this will be, it is but little compared with the importance of getting the duty reduced here. It is admitted to be excessive, and while the highest authorities declare increased indirect-taxation to be necessary, they also see the need of broadening its basis by adding to the number of dutiable articles. Every additon brings nearer the day when taxation can be more equally distributed and relief given to those upon whom the burden has fallen most heavily.

But what are growers to do in the meantime? It is easy to say "curtail the supply"—but at whose expense and how is it to be done? A decline in the value of the finer qualities, discouraging to those who grow and import them, has been the result of heavier duties and lighter crops. Quotations always move towards an average; a short supply means higher prices for common followed by lower rates for fine tea, and the approximation in value of the different qualities will be accentuated if the crops be shortened only at the end where cheap teas are made, although the average value of the whole would be raised. The problem is a hard one, but it must be faced, and persuasion of its difficulty lead us once more to speak of

THE BENEFIT OF AMALGAMATION.

To combine in one interest estates in the same district is good; to unite those in different districts, yielding both high and lower-price tea, is better; to link together groups of estates in Ceylon or India, and thus lessen the risk to which individual growers are in turn exposed by a change in value of the particular variety they happen to make, would be best of all, and it would facilitate all-round reduction in the quantity, the shortest road to all-round recovery in price, But things being as they are, we have to consider probabilities. They seem to be that more low-priced tea will be made; that its value may recede, especially if the increase be obtained by coarse plucking, and that a recovery in rates for better qualities may follow. Those who contemplate making heavy crops should, therefore, watch what is being done in their district, and the quotation for common tea in London, lest they repeat the experience of 1900-1901. Those who usually make a large crop of medium quality should, we think, make a smaller one, concentrating attention upon its improvement; while the few who grow the finest varieties should, maintain the highest possible standard of quality. Extensions should be stopped for the present, the closest scrutiny be applied to expenditure, and labour and energy be transferred from poor acreage not giving a profit to that part of the estate which pays for cultivation. Now

AS TO FINDING FRESH OUTLETS,

progress has been slow where the most pains have been taken, *i.e.*, in the United States, and quicker where our tea has been suited to local tastes and has made way on its merits, *e.g.*, in the Colonies and Russia. What is the bearing of this upon future efforts? It teaches us that it is of little use to push black tea upon those who want something else, and that if the industry is not to stand still we must learn to make what others wish to buy. The funds raised by Cess or otherwise should, we think, first be spent in freely subsidizing the pioneers prepared to make the new kind suitable for America and foreign consumers—say to the extent of 10 million lb. this season and 15 millions next. The outlay will be recouped later on in the price of black tea, and in the extension of India's and Ceylon" trade. Then, if enough money be available, let it be used for extending the work already begun of making the merit of tea known in European countries whose vast populations are still almost strangers to its value. At our doors are 200 millions of potential tea-drinkers taking between them a mere 15 million lb per annum. Surely a wide field for enterprising traders to explore! But these are visions of the future: our present task is to reckon how much we can take here. In 1901 nearly 300 million lb. were disposed of—256 millions at home and 43½ millions abroad—but this included the excessive clearances in the spring,and perhaps was not all used; allowing for increased consumption, we therefore assume 300 million lb to be the utmost we can sell here without lowering the price;to meet it there is in boud a stock of 82 millon lb,—10 millions too much we therefore estimate that imports should not be more than 290 million lb. Apporting this on the basis of recent deliveries, India's share would be 158 millions, Ceylon's 106 millions, China's 20 millions and Java's share 6 millions. How to keep importation within these limits and find a market for the rest elsewhere are problems to be solved,

We abstain from discussing matters of detail and conclude by saying that severe as the trial is through which many Planters are passing the position is better than it was twelve months ago. We have still to feel the full effect of extensions made in former years but it will not be quite what some seems to fear for against yield from new gardens must be set the deterioration of old ones and the abandonment of outlying and unprofitable plots which continually goes on, and the more rapidly when expenses have to be cut down and the labour staff is reduced.

Wm. Jas. & Hy. THOMPSON.,

PLANTING NOTES.

The Ceylon Association's Annual Report appears on page 96, and deserves careful perusal, along with that of the Tea and Produce Committee. The latter body showed over £125 balance; and the "Association £38, which was divided between the "Planters' Benevolent" and the Ceylon Contingent.

Rainbow Trout in New Zealand.—During the coming season the Wellington Acclimatisation Society expects to have, given even moderate success, 500,000 rainbow trout ova and fry for sale and distribution. The proportion of rainbow fry in the Masterton ponds is far larger now than the society has ever had before.—*Auckland News.* May 29.

Stingless Bees.—Stingless bees are not uncommon in the West Indian islands, living wild and making nests in trees. A colony is to be seen in the Dominica Botanic Station and is worth a visit. The bees are small and very active, and become very excited if the nest is disturbed. Even though one knows they are stingless, it is hard to remain near the nest when the bees become angry and fly about just as the real honey-bee does: one instinctively fears a sting, and instinct in this case proves stronger than reason. The bees belong to an undescribed species of *Melipona*, a genus which includes numerous tropical stingless bees.—*Agricultural News*, May 24.

Coffee.—During the coming year it is expected by some authorities that the coffee crop will be small both from East India and Central America, with the exception of Mexico where a larger yield is promised. Costa Rica will also produce a much smaller crop than usual. According to "American Trade," however, the crop of coffee from the States of Salvador, South-Western Honduras, Western Nicaragua, and Costa Rica will be as large in quantity for 1901-1902 as the aggregate of the last two crops. The cost per pound to gather it for market will be more than twice that in previous years—*Tea* for June.

THE NORTHERN PROVINCE (CEYLON) IN 1901.

(Extracts from Mr. Ievers' Administration Report.)

TOBACCO CULTIVATION.

Next to food supply, this industry ranks highest in this Province. The following is the statement of tobacco exported beyond sea and coastwise:—

Beyond Sea.

	Quantity. Cwt. qr. lb.	Valne. Rs. c.
1900 ...	42,519 0 17 ..	981,665 05
1901 ..	28,269 2 4 ...	673,061 68

Coastwise.

	Quantity. Cwt. qr. lb.	Value. Rs. c.
1900 ...	25,932 2 12 ..	602,070 25
1901 ...	51,220 2 12 ..	583,660 60

It is important to note that the export to Travancore has fallen, while the local trade to Colombo and other parts has more than doubled. The Travancore trade has fallen off from the successful competition of Coimbatore tobacco, and the price has fallen. It is a matter for the serious concern of the local producer to find outlets for his tobacco. This can only be done by improvement of the process of manufacture. It will, I hear, take a long time before the grower realises this, and meantime he must be content with less profit and reduction of crop. During the close of the year Jaffna was visited by Mr. MacD. Gibson, who is said to have large experience of tobacco growing in Sumatra and elsewhere, and he expressed his opinion that the locally-grown leaf is of excellent quality, and the methods of planting and irrigation are sound; but the plucking is erroneous, and the curing injurions to flavour. The leaf is actually made rotten, and hence the difficulty in keeping the cigars for any length of time. He was unsuccessful in inducing any local capitalist to take up new methods. The idea here is that, when such methods are introduced by other people's money, the local grower and manufacturer will learn the methods without expenditure. Meantime I am rather discouraged at the prospects of this important branch of trade. The great increase in export coastwise cannot be maintained without a heavy fall in prices, for the market is now glutted, and there is little or no possibility of local expansion for the class of cigar now produced.

It is possible that Government may grant a concession of land in the Vanni for experimental cultivation of tobacco under proper guidance. I think this would be useful, for, if the people see that tobacco cured in the modern methods fetches a higher price, it may induce them to follow these methods and obtain a more extensive market. But no initiative can be locally expected.

CATTLE.

The following is an account of cattle in the Jaffna division:—Buffaloes 3,552; Black cattle 163,911; Sheep 77,236; Goats 57,284.

There was no cattle disease in the Jaffna District during the year, and the condition of the cattle was on the whole good. An experiment was made, through the local Agricultural Association, with fodder seeds obtained from Queensland. I regret to say it was altogether a failure, as the seeds did not germinate.

Another attempt will be made after request for special care in selection of fresh seeds. An irrigation wheel, which can be easily made locally

and worked by a pair of bulls, was procured from Cyprus. It has not been tried experimentally, pending receipt of some information which has been asked for from Cyprus.

IMMIGRATION.

The immigration route continues to be closed from the early part of January, 1900. But during the year a relaxation of the plague regulations was made in respect of the coolies for the Giant's tank works, and 42 coolies were landed at Pesalai from South India, the number of emigrants being 15.

The whole question of immigration and the best route for coolies into Ceylon must soon be well weighed and considered. This consideration will be forced on the local Government when the South Indian Railway system has been extended from its present terminus on the mainland to the proposed harbour on Ramisseram island. It will then be a question whether the steamer lines are to run direct to Colombo, where the Ragama Camp is used, or be taken to a similar camp on the mainland of Mannar and on to Madawachchi Railway Station. A road tram line would probably afford the best means of transport from the landing-places to the camp and onwards. The camp would probably be formed somewhere near Murunkan, and between the 10th and 14 miles from Mannar, for a sufficient supply of good water for a large camp is not procurable nearer to the points of landing.

A steam ferry would probably replace the sailing ships in conveying the coolies to Vengalai and Pesalai according to the monsoon seasons. Possibly a road-tram from Dutch Bay to some convenient point on the Kurunegala-Anuradhapura section of the railway might be better. No doubt the two routes will be considered in the view of cost, convenience and time of transit. But any reversion to the old system of road travelling for coolies is to be most earnestly deprecated.

DESTRUCTION OF WILD BEASTS.

This item is more important in the Vanni and Mannar Districts. For the Jaffna District rewards were paid for the destruction of ten leopards and three bears in the mainland divisions. But since more is paid by traders for skins than can be obtained in the official reward, the figures in no way represent the actual killing of these animals.

HORSE ESTABLISHMENT, DELFT.

The following figures give the statistics of the establishment:—Revenue R1,675; Expenditnre R832·97; Nett Revenue 842·3.

There were 32 births during the year, of which 9 died, chiefly of weakness caused by the mothers being old. Eight brood mares died during the year of old age, and they have been replaced by young fillies from Iranativu.

There were at Delft on the 31st December—Stallions 2; Brood mares 60; Foals 33: and at Iranativn nnder three years old 26.

From the commencement of the experiment in 1898 the total expenditure has been R5,140·36 and the revenue R7,839·80, giving a nett profit of R2,699·44. The expenditure include, besides the annual staff expenses, the building enclosures and the purchasing of stallions. The experiment has so far been a success financially, but I do not so much regard the making of revenue as the protection and improvement of these ponies, which are so hardy and useful in a climate like North Ceylon, where Australians cannot be

kept. From the breeding point of view the experiment has been successful, and the cross of the Delft with the Arab has produced a very much improved young stock, which is now coming on for sale. After another year all the young stock will be either half-bred Arab or half-bred Indian. The only drawback has been an excessive mortality, which has arisen in two ways:—(1) Anæmia and 'poverty" among the young foals on Delft arising from "tics"; (2) the mortality on Iranativu among apparently healthy fat horses, the cause of which we have been unable to ascertain. During the months from August to October we have lost about twenty-five per cent of the stock.

(1) This has, I think, now been controlled. By the advice of Mr Sturgess, Government Veterinary Surgeon, the foals have been rubbed fortnightly with an oil mixture, and since 1899 very few foals have died from preventible causes. It is now proposed to build a bath and drive the foals through a solution in the manner used in Australia and South Africa, for hand rubbing is impracticable where a large number have to be dealt with. I am indebted to General Olivier for some valuable suggestions as to the methods used in South Africa.

(2) The mortality at Iranativu is still unexplained. Last year Mr. Sturgess found the ponies suffered internally from parasitic worms, and we attributed the death to this cause. The disease disappeared by treatment, but, although the water-holes were carefully cleaned and fenced, the same mortality occurred at the same time. One of the finest colts was seen, apparently quite well, in the morning by the Stock Inspector, who was on the island, and was found rolling on the ground in the evening, and died before any treatment could be applied. Unfortunately the intestines were too far gone for *post-mortem* purposes of examination by Mr. Sturgess.

The occurrence of some poisonous plant at this time of year seems to be indicated, and a botanical examination of the island becomes very necessary. I shall be glad to have the help of a botanical expert, whose researches might be able to throw light on this hitherto obscure cause of mortality. It is noticeable that there is no mortality among the cattle, sheep, or goats, which graze freely over the island at this time, nor does it appear in Delft. If the mortality could be controlled, the profits would be very largely increased, as well as the supply for the public, which at present falls short of the applications. I have written at length on this subject, which, though a trivial one in administration and revenue, is of great interest and real value to persons who have need of such animals. The experiment has proved a success, and it may be extended now, with satisfactory results. I was unwilling to ask for any considerable expenditure until I could show that the business was on a sound basis, and for this experiment was necessary. I have now no hesitation in recommending that Government should take up the business in earnest, and, if carried on upon the lines that experiment has proved to be successful and with regard to economy, I believe the Islands will be a source of both revenue and public advantage. Indeed, if this establishment pays its way without profit, it would be sufficient. But I must admit I prefer to conduct it on "business principles."

I observe that country and Indian 'tat' ponies are now being advertised as 'Delft' ponies. No ponies under 13 hands are now sent out for sale; most of them run to 13·2 to 13·3 hands, and they are not 'cow-hocked' like 'tats.' It can therefore be easily seen whether the description is correct.

CATTLE BREEDING.

I am very anxious to improve the cattle in Delft. As cattle disease never occurs there, it is quite an ideal place for raising a good breed. But from over-numbers the cattle have greatly deteriorated in the last fifty years, and the Island cannot support the 14 000 heads which are at present on it. The people are very ignorant and suspicious, but I hope by means of village rules for limiting numbers and castration or sale of poor-quality animals, and the introduction of Scinde bulls, to show the people that they can get more profit from even half the number. During the year (1901) 831 animals are reported to have died on the island from insufficient grass and water. Such (preventible) mortality is shocking. I have received good accounts of the Scinde bulls placed at Mannar, Vavuniya, and Iranativu. At the end of the year I placed two Scinde bulls on 'Delft.' This breed is excellent for milk produce, but the bulls are rather too small in height. I think we should try some other, possibly South Indian breed. The difficulty about these, however, is that they deteriorate unless highly fed.

TOBACCO IN BRITISH CENTRAL AFRICA.

A correspondent in Nyassaland writing to us in April last, says:—In the early days of this Protectorate tobacco was cultivated for consumption within the Protectorate by Messrs. Buchanan Bros. Subsequently it has been grown by Messrs. Hynde & Stark, and by Mr Henry Brown of Mlanje. At the present moment, perhaps, the largest cultivators of this produce are Blantyre and East Africa, Ltd., and Mr. Brown. Considering that we have no experts in curing tobacco, no market has been found for it in London, and with the exception of a small quantity sent to South Africa the remainder is consumed locally, as cut tobacco and cigars. It is thought that in the event of our joining the South African Customs Union, we shall be able to trade in this article to better advantage.

Taking this country as a whole, the land suitable for tobacco cultivation is almost unlimited. By planting the young seedling tobacco plants early in the wet season three or four cuttings or crops may be secured in the year. In the "Journal of the Society of Arts," for January 31st, 1902, is a note on "Tobacco Culture in Hayti," in which the length of leaf is given as 20 in. Here we can grow it fully 30 in. and broad in proportion without blemish. So that it is not want of proper material, but the correct method of curing which is our desideratum. Havana tobacco is the variety most in cultivation, though this year our Scientific Department distributed to planters seed of a number of the best varieties.

Nowhere in B.C.A. is tobacco found growing in a wild state, but, as a remarkable instance of the longevity of tobacco seed, it is worthy of note that after a coffee plantation is first cultivated there are sometimes numerous kitchen middens exposed, and almost exclusively composed of wood ashes; on these, particularly in the Namasi district, tobacco plants grow spontaneously. At

the time (1861-2) of the first missionary occupation of this district it was densely populated, but when it was first opened up by coffee planters no people lived there, so that it was overgrown with timber of an average height of 30 to 60 ft., —ample proof that this seed has remained in a fertile condition for forty years more or less. This variety of *Nicotiana* is probably *N rustica*, also found on the West Coast of Africa and elsewhere.—*British Trade Journal*, June 1.

PLANTING IN THE MALAY STATES.

(*Extracts from the Report for 1901 of the United Planters' Association, F. M. S.*)

Export Coffee to Europe.—With the idea of eventually placing regular monthly consignments of 10 piculs upon the London market to attract attention to our coffee, several of your members combined and sent a trial shipment of 80 piculs. This was bulked in the Port Dickson Co. Mills, and sold through Messrs. Frame, Alston & Arbuthnot. The price realized was 32s per cwt. which worked out to $17·78 per picul. This result was not sufficiently encouraging to provide any inducement for persevering with the experiment, and no further shipment of any size wae made. A small parcel of 12 piculs was, however, purchased to test the respective merits of sun-drying and storing in Port Dickson and Aden; 7 piculs of this, which the Port Dickson Coffee Curing Co. took in hand, were sold in London at 30s per cwt., whilst the 5 piculs sent to Aden realized only 26s per cwt. There were grounds for believing that the Aden shipment was not properly looked after, and therefore no information of any value was derived. A large parcel of good 3-year-old Coffee was disposed of at $2 per picul less than No. 1 fresh from the plantations, and the idea has gained ground that to speculate by holding, on the assumption that coffee appreciates in value with age, is a very doubtful policy. There may be markets where old coffee is eagerly competed for, but Singapore is certainly not in touch with any of them. Reports from London Brokers favour shipments of coffee dried in the cherry before peeling, and report such coffee to be sweet and suitable for home consumption, but it is suggested that a market for this description must be gradually built up, and no shipments of any size are known to have been made.

Yield of Copra.—In response to a request for information on this subject, the Manager of the Singapore oil mills kindly favoured us with the following communication which your Committee think thoy cannot do better than reproduce "in extenso."

Mr. E B Skinner, Secretary, the Planters' Association, Selangor, Singapore, October 11th, 1901.

Dear Sir,—I am in receipt of your letter of the 19th ult. *re* the various copras and their comparative yield of oil. The copras arriving in Singapore usually go under the name of the Island or State they come from, as for instance Bally, Macasaar, Selangor, Kelantan, etc. These copras are more or less the same, the real difference being that, while same qualities are made from ripe and fully-matured nuts, others contain 50 per cent of copra made from half-ripe nuts; consequently the yield of oil from the latter is much below that of the former.

Formerly Bally copra was recognized as the standard for "Sun-dried Quality." It was thick, dry, and rich in oil. Evidently great care was taken in picking only the ripe nuts, and it was properly dried before being packed. This copra has fallen from its first position and is now very inferior, being no better, if as good, as the poorest qualities.

Some samples of copra from Penang and Kelantan have given good results but, as mentioned above, all depends on the percentage of unripe copra in the parcel, and where you may get one shipment with, say, 5 per cent of unripe in it, the next lot from the same place and dealer may have 50 per cent.

Occasionally a small parcel will arrive from the Nicobar Islands. This copra is evidently made from a nut much smaller than those usually seen in Singapore, the kernel is very thick and rich in oil. Our Chinese dealer says it is made from the "Klapa Raja." Ceylon copra is also noted for its richness in oil, yielding about 3 per cent more oil than the Straits article. Yours faithfully, (Signed) The Manager, Singapore Oil Mills.

Experiments made with Firewood, to decide the respective merits of Casuarina, Bakau (mangrove) and ordinary wood, were undertaken by the State Engineer with the following result.—

Firewood.	Hours worked.	Consumption in lbs. per hour.	Cons'ption in cubic feet per hour.	Average time taken to get 50 lbs. steam.	Average steam pressure.	Average weight per cubic foot of firewood.
Casuarina	105½	56·44lb.	1·22c.ft.	2hors.	81·7lb	46lb,
Bakau	57¼	78·25 ,,	1·21 ,,	2 ,,	81·6 ,,	64½ ,,
Ordinary	62	75·8 ,,	1·36 ,,	1·68 ,,	87·5 ,,	55½ ,,

The above trial very clearly demonstrates the superiority of Casuarina. This tree has been largely planted in Southern India for future fuel reserves, and, as seed is easily procurable at an almost nominal price, it would seem sound policy for the F M S Forest Department to follow the example of India in districts which have been largely denuded of jungle.

Rubber in Mexico.—On the 24th October your Chairman addressed a letter to H B M Consul, Mexico City, D F Mexico, asking for further information regarding the "wild rubber" in Mexico and any cultivated varieties in that republic, but so far no reply has been received although your Chairman's letter was the outcome of a communication from the Consul to the Singapore Chamber of Commerce.

Rhea Fibre.—The cultivation of this product has attracted little or no attention during the past year, owing mainly to the uncertain market for ribbons Upon information received from Sir F Abel, Director of the Imperial Institute, to the effect that a firm of high standing in London were prepared, for several years to come, to purchase Rhea ribbons at £15 per ton, the Government by notification in the different "Gazettes" gave wide publication to this offer. When a member of your Association however interviewed the firm in question in London, he was told that they would take 100 tons at £15, after which they could not guarantee a price. Such a rapid change of front was not allowed to pass without comment, and your Committee are pleased to be able to report that H E the Governor considered the matter of sufficient importance to refer to Sir F Abel, who has dealt with the complaint in a manner leaving nothing to be desired.

Catch Crops.—Very little success has attended the efforts of those who have endeavoured to keep down expenditure by the cultivation of subsidiary products. The outlets are too small and markets are in consequence easily swamped. As long as prices keep up, the Chinese sub-lessees will maintain their kladdie or pumpkins, as the case may be, in fair condition; but directly a slump occurs, they cease to weed and indeed to put any more labour into the undertaking at all, with the result that the Superintendent hae to devote a lot of valuable time to trying to get things straight, and usually meets with very indifferent success. It is generally recognised now that, if more than one product is to be cultivated upon the same ground, the best combination is Coffee and Para Rubber, the former planted close, to yield maximum crops within a limited period, and the rubber at whatever distance may most commend itself to the individual proprietor.

Coffee.—The export returns for Perak, Selangor and Negri Sembilan show an increase in 1901 of 6,476 piculs: this must be considered a satisfactory result in view of the fact that prices averaged $18·29 per

picul as against $20·80 in 1900. Moreover exchange fell from 2, (demand selling rate on London) in Janu. ary to 1/10⅛ in December, but for which fact, dollar quotations would presumably have been lower still. A good deal of Coffee has nevertheless been planted in 1901, mostly in conjunction with Para rubber, and cultivation has been well maintained, whilst quality has improved, and complaints on this score have been much less frequent. Reports from Brazil go to show that the coming season's blossoms have to a great extent failed, and there is a widespread belief that 6,000,000 bags will be the limit of the crop actually gathered in Rio and Santos, though the unloading of heavy stocks may to a great extent counteract the hardening effect which such a phenomenally poor crop should exercise upon the market. It is a somewhat debatable point whether the failure of the blossoms in Brazil is to be attributed to the impoverished condition of the trees, consequent upon inadequate cultivation and a succession of abnormally heavy crops, or whether the season has been unpropitious. If the former assumption be correct, then there can be little doubt that a steady and continued improvement may be confidently anticipated, but advices are so conflicting that it would be premature in the extreme at this stage to attempt any reliable forecast.

Coconuts.—Owing to the ravages of beetle and the cost of keeping the trees clean, Coconuts are not as much planted as their fine growth would lead one to suppose that they would be. Doubt has also been expressed as to whether the soil, except that actually on the sea-board, is suitable. The Selangor Planters' Association Annual Report however states that, on a small holding in the Klanang District, trees from 10 to 12 years old have yielded an average return of over 51 nuts per tree, although this plantation was opened by Malays and considerably neglected during the first eight years of its existence. Such a return is under the circumstances decidedly satisfactory, and your Committee are of opinion that the cultivation will always be a remunerative one as long as it remains possible to keep the beetles under without incurring a prohibitive expenditure in doing so.

Gutta Rembong (Ficus Elastica).—The unsuitability of this tree for planting amongst Coffee, to some extent accounts no doubt for the preference shown to Para. Nevertheless when put out on soil which it likes, growth has been very fine, but it has shown itself to be a tree which will not flourish anywhere and everywhere, and for it to make a vigorous start it appears essential that there should be a fairly rich surface humus or lots of ash after a recent burn. On rain-washed and impoverished hill-sides, it sulks from the day it is planted, but grows splendidly on practically bottomless peat, if well drained. Mr. Derry of Perak has interested himself more than anyone in this variety of Rubber, and is very sanguine of its eventual success, though he thinks that "perhaps eight years may have to elapse before the tree can be profitably tapped." In Malacca 4-5 years old trees are however being worked by a Chinaman who professes to be quite satisfied with the results, but his figures of yield and cost are considerably involved and difficult to follow. In Perak two 19 year old trees each yielded 25 lb. in one year, and of these Mr. Derry reports "the tapping was far short of being exhaustive." The value of this rubber is slightly less than para, and the method of collecting differs, in that the latex of the "Ficus" appears to coagulate on the trees, whereas that of Para runs freely, down the cuts made in the bark into tins.

Hevea Braziliensis: Para Rubber.—With the decline in the price of coffee this product have been largely planted throughout the Federated Malay States, and when kept clean of weeds has everywhere come on in a fashion which clearly indicates that soil and climate agree with it admirably. The wintering habit of the tree, which is almost universal, seems to afford a further proof of this country suiting it. Some experimental tapping of young trees, which has been undertaken, goes to show that in 4 to 5 years from planting about 6 oz. of dry rubber may be regarded as the average yield of the best grown trees, and some 6 years old trees have yielded over a pound at their first tapping. The coming year will undoubtedly provide many returns of experiments for comparison, but at the present juncture very few Estates have any large number of trees ready for tapping.

Export of Coffee, F.M.S.

		1894	1895	1896	1897
Selangor	pkls.	2,588	4,532	7,046	12,491
N. Sembilan	,,	unknown	unknown	unknown	1,071
Perak	,,	1,662	1,937	2,209	2,759
Total	,,	3,950	6,469	9,255	16,321
		1898	1899	1900	1901
Selangor	pkls.	22,948	26,407	34,295	37,664
N. Sembilan	,,	3,163	4,541	6,199	9,769
Perak	,,	2,837	932	4,269	3,806
Total	,,	28,948	31,880	44,763	51,239

INDIAN SALES OF CHEAP TEA BY LOTTERY.

Yercaud, June 20.—It has lately come to my notice that small packets of tea, containing about an ounce, are being sold up here by the Postmaster of Nagalore, for the small sum of three pies each! and he is allowed a commission of 10 per cent. on all he sells—from Messrs. Andrew Yule & Co., Calcutta. On the packet are the words "Indian Tea Markets Extension. The World its Field. Andrew, Yule & Co., Calcutta." Each envelope is marked with a letter and a number, the one with me now is G. 47,744, and it is stated that monthly prizes are awarded to any one holding the envelopes with the numbers drawn as prizes. There is one prize of R50, five of R5 each, ten of R2 each, and fifty-five prizes of R1 each; in all R150 a month is disbursed in prizes, or rather was disbursed in May. This is certainly a very sporting endeavour to push the sale of cheap tea. Those who are in authority, and have the interests of the coffee planting industry at heart, should bestir themselves with their product of coffee, and go and do likewise. —*Madras Mail Cor.*, June 21.

THE DRUMMOND DEANE GREEN TEA PROCESS.

(Extract from a letter to *Indian Gardening and Planting*, June 19.)

From the commencement of the process the Drummond Deane system has the advantage, for it is possible with the machines to treat the green leaf in large quantities at a time, and a whole roll of leaf can be prepared by the work of a single coolie attending the machine and be ready for the next process in two or three minutes. But so rapid is the process of preparing the leaf that most concerns prefer to take Green Tea machines of smaller capacity and find that they are able to keep pace with the rolling machines in working off the leaf as the half hour or so required for rolling gives ample time to pass sufficient leaf through the Green Tea machine to be ready for the next roll. There is also an absolute certainty that all the leaf that is put through the machines

will be thoroughly prepared automatically and brown leaf showing semi-fermentation never disfigures the outturn of a Drummond Deane tea, as too often proves the case with leaf prepared on the old Indian system. I do not say that semi-fermented leaf must occur in the old style Green Teas, but that it requires great care and constant supervision with our inefficient coolie labour to prevent the operation of preparing the leaf on the old system being carelessly performed, and then a certain proportion of the green leaf will escape proper contact with the hot pans on which the leaf is prepared on the old system, and these are bound to ferment later and spoil the true character of the tea. It is not possible to detect any lapse of this sort on the part of the coolie until the tea is made, when the mischief is done.

It is possible, of course, to ensure that the process shall be thoroughly carried out, but this, as every planter and tea-maker knows, means extra supervision and consequent throwing up of cost of production, which, with prices now to be obtained for tea of any description, is not to be incurred if it can be avoided. On the other hand, with the Drummond Deane machine every leaf is equally treated; it is only necessary to open the valves and set the machinery in motion by means of the change wheel and driving belt and the machine automatically does what is required, discharging the leaf thoroughly ready at the end of a minute or two. One man can treat up to three maunds at a time on the limit of sizes that have been found most convenient. It is the old story of machine *versus* hand labour, and it does not take a prophet to tell which must go to the wall. In the rest of the processes in the Drummond Deane system the ordinary black tea machinery is utilised, though of course the processes are greatly modified, and in these modifications the skill of the inventor, Mr Drummond Deane, has been shown. It would be futile to attempt to make Green Tea on the ordinary black tea machinery without the instructions of the inventor, as a good many have found out to their loss, and naturally these special instructions are guarded and only issued to those purchasing the machines. The whole process also compares with great advantage with the old system in point of time, and it is very true in tea as in other things that time is money. In some three to four hours the green leaf should be turned into finished Green Tea, uncoloured. The colouring or finishing process is just as applicable to these new style teas as to the old style, and if Mr Leslie Rogers were here I could show him samples which he would be fain to admit compare well with anything he has seen on the old system. With regard to the question of time taken in manufacture, a notable advance has recently been made by the new Deane-Judge machine, which we are now about to introduce. This new machine performs a supplementary process which much improves the condition of the leaf and very materially shortens the time taken in manufacture, beside making the process entirely automatic.

With regard to the finished product, it is just as feasible with suitable processes to colour and finish Drummond Deane Green Teas to any required appearance, and the only difference they present to the old style Green Teas when so treated is in the absolute purity of their cup and the uniform green colour of their infused leaf, points in which old style Green Teas are apt to be faulty, unless a very thorough and consequently expensive supervision has been given. But it is a moot point whether the colouring process is necessary to the advance of these Green Teas; the Japanese are more and more dispensing with the operation which adds nothing to the quality of the tea, and only satisfies a prejudice in point of appearance. Compare the beginning of the Ceylon Green Tea industry; it began about four years ago with a few thousand pounds; in the third year it reached nearly two million pounds; not much, it is true, in the eyes of those who want to rush everything and failing immediate success abandon the attempt, but sufficient to show that we are driving ahead in the same way as we did in the early days of black tea. The great point is that the motion has all been in a forward direction.

With regard to the Afghan market, the North-West planters cannot pretend to make a preserve of it. If their old style Green Tea is so much better, they are so favourably placed that the Bengal planters should not be able to compete with them. It was the special appreciation of the Manabarie teas made on the Drummond Deane system that drew the attention of the Bengal and Surma Valley planters to this Trans-Frontier market and the Association had nothing to do with it. Mr Rogers may be right as to the necessity of colouring the teas to the appearance with which the Afghans are familiar, for the Envoy judged them on the merits of their cup in which the Drummond Deane teas stand pre-eminent. But that circumstance will not prevent these teas making way. We are prepared if necessary to colour them to any shade that the Afghans may prefer, even to painting them all the colours of the rainbow, like Joseph's coat or a German Jubilee design.

The Agent,

Drummond Deane Green Tea Process and Machinery.

Calcutta, 16th June, 1902.

THE TEA MARKETS EXPANSION COMMISSION.

Messrs Andrew Yule and Co, the Commissioners appointed by the Advisory Committee of the Indian Tea Association to extend and expand tea markets in India, have issued their seventh Report. We learn from it that the support accorded them has been steady and progress satisfactory during the three months in question, viz., March, April and May. The Commission, it will be remembered, came into being about the middle of last year, helped with a grant-in-aid of R40,000 from the Indian Tea Association and contributions of tea from planters up to 700,000 lb. The work has been continued on the lines that we have noticed before in these columns, and the reports received of its progress in all directions are encouraging. Of the 372,879 lb of tea, that up to the 31st ultimo had been contributed or purchased, 273,574 lb have been disposed of. The demand for the pice packets continues satisfactory, no less than 894,734 having been sold. The price of them is the same all over India, viz., one pice each. The total number of cups of brewed tea, which also are sold at one pice each, has risen to 219,244. Pice packets are now to be procured at 695 extra-departmental post-offices as against 70 on the 28th of February last, and applications for agencies are still coming in. Brewed and dry tea is now on sale to native passengers at 13

stations on the East Indian Railway, on the Oudh and Rohilkhand Railway, and on 17 stations on the East Bengal State Railway. Tea is also supplied on the latter railway by men travelling on the line, to whom the manager has kindly granted free passes. The Indian General and River Steam Navigation Companies have also kindly granted permission for the sale of tea to native passengers on their steamers and have offered to give free passes to the men employed by the Commission for that purpose.

The receipts during the three months to which this Report refers total up to R35,205-3-7, which is a very satisfactory increase; and the balance in hand on the 1st June was R69,879-7-7. The cost of working during these three months has been roughly R13,000, making a total of R30,000 to the end of May. The support accorded to the Commissioner to the same date, exclusive of the Indian Tea Association's Grant-in-aid, amounts to R97,474-10-7 in cash and tea—the average value of the tea supplied being taken as 3 annas 11 pies per lb. The Commissioners, in concluding their Report, which they hope will be considered satisfactory, trust that contributions in future will be made as much as possible in cash instead of tea, on the basis of, say, 4 annas per lb. They claim that the advantages of cash contributions are twofold; *firstly*, the Commission would be enabled to purchase tea of exactly the style required, and in such quantities as to avoid unnecessarily running into stock, and *secondly*, the purchase of tea at public auction would tend to stimulate competition, and thus indirectly return an immediate benefit to the contributors. At the same time the Resolution which was passed at a Meeting of the Advisory Committee of the Commission on Tuesday last, as reported among our telegrams, urging on all Tea Companies, proposing to destroy large quantities of tea in order to prevent a slump in prices, to make it over to the Expansion Commission to supply the growing wants of the new trade in India, is an eminently practical and sensible suggestion. This is in reference to the telegram from London recently received, which stated that at a Meeting of Indian merchants representing tea interests in India to the value of £1,000,000 sterling, which was held there towards the end of last month, those present strongly favoured a proposal to throw away all tea from the 1st to the 15th August, the most prolific month. It was estimated that 10 million lb. of tea would thus be kept off the market.—*Madras Mail*, June 26.

TROPICAL CULTURE.

(*From a Correspondent*)

The Official "Bulletin Economique" of Indo-China seems only of local interest; but I read that a Tonkin planter is going to plant *Momordica luffa* of which the fibrous sponge has several industrial uses.—One kind grows wild in the lowcountry here; another is cultivated as a vegetable. For the above purpose there is an Egyptian variety, very large, of which the fibrous part of the fruit is sold as vegetable sponge. I think it would be a very paying product for natives to cultivate.

The French Government is going to experiment on the action of phosphates on cultivation, rice particularly, in the different parts of Indo-China. I think that in Ceylon, where the yield of paddy is generally so small, our paternal Government ought to do the same. Better try and double the crop of the land in cultivation, than construct or restore costly tanks to double the area which might be cultivated?

In the February and April numbers of "Societé d'Etudes Coloniales" appears a translation from German of a recent work on *cacao* by Dr. Paul Preuss.* It is very interesting for cacao planters. There is no mention of "Traduction réservée."

* Paul Preuss I met in Cameroon in 1892. He was already then Director of the Government Botanical Gardens.

MR. GREEN'S CIRCULAR ON HELOPELTIS.

(*To the Editor, local "Times."*)

SIR,—May it not be possible that, like the mosquito, helopeltis breeds naturally in swampy places and standing water? It certainly hates the sun and lives by suction, and I have noticed that when a field is attacked helopeltis appears at the lower end near a stream or standing water first. It might be worth some low-country man's while to investigate for, if this were proved, helopeltis might be kept in check by sprinkling kerosene in all wet places, as is being done to eradicate the mosquito. It has always appeared to me that such pests as helopeltis and caetdis worm might be kept in check by burying prunings with a sprinkling of lime, or better still basic slag. Burying prunings has checked grey blight on this estate to an enormous extent; many fields which were a mass of blight are now almost free. That helopeltis is coming up-country is an undoubted fact. Mr Green mentions Nawalapitiya. I saw signs of helopeltis just below Ginegatennie Gap a day or two ago—this is very much higher than Nawalapitiya. I have never seen tea in the Kelani valley so badly attacked by helopeltis as it is just now. On one estate the best field was absolutely ruined. I doubt if coolies could have plucked a five lb average. I noticed in some paper the other day that the farmers in South Africa had found treacle and arsenic to be a perfect cure for locusts. Would this be useful for checking white ants which do far more permanent damage than helopeltis? Treacle made out of jaggery would be very easy to procure, and very cheap. Each pruner as he finishes pruning a bush might smear a little of the mixture round the stem. This might also keep borer and other pests in check.—Yours, &c.,

D. G. BREBNER.

Kew, Norwood, June 21.

REPLY TO MR. BREBNER'S LETTER.

SIR,—With reference to Mr Brebner's letter, in your issue of the 23rd instant, the breeding habits of the *Helopeltis* insect are well known. The eggs are embedded in the shoots of the tea plant. All members of the family *Capsidae*, to which the *Helopeltis* belongs, have an exsertile horny ovipositor, which indicates a similar habit of oviposition. It is quite out of the question that they could "breed naturally in swampy places and standing water," as suggested by your correspondent. Under these circumstances, the sprinkling of kerosine over the swamps could have no direct effect upon the pest. It may be true that *Helopeltis* is more prevalent in damp places; but such a fact (if fact it is) might be due to many other causes. The insect may prefer a sheltered situation, and swampy spots are usually in hollows. The insect almost certainly prefers trees weakened from any cause and trees growing in damp spots are frequently unhealthy. The supposed fact is, however, open to question. I have been collecting particulars of the work of *Helopeltis* for several years, and have frequently received reports that the attack has been most severe on exposed ridges with poor soil. I have always advocated the burying or destruction of prunings as a means towards the check of all insect pests. The application of treacle and arsenic to the stems of pruned tea bushes—if otherwise practicable—would probably have little effect against white ants, as the syrup would im-

mediately attraet hordes of the more aetive true ants, which would speedily remove all traces of the mixture. though thousands would perish in the achievement. The wholesale destruction of these ants would be a distinet misfortune, and would probably result in a marked inerease of real pests, upon many of which they prey. Applieation of an arsenical preparation—such as Arsenite of Copper, or "Green Arsenoid"—*without* the treaele, would be more effective against the attaeks of white ants, as it would not attract the attention of other inseets.—Yours, &e., E. Ernest Green.

Peradeniya, June 25.

LAGOS FOREST RESERVES AND RUBBER.

In October, attention was drawn in the paper "West Africa" to the faet that indignation was felt in Lagos at the Ordinance introdueed into the Legislative Conneil by the Governor, in September (called the Forest Reserves Ordinance), with the object of proteeting the rubber trade, by which it was sought to impose the requirement of a licenee before rubber trees eonld be tapped or the produee could be sold. It was stated that the natives regarded the proposed legislation as an unjust interference with the rights of the owners of land, and that great dissatisfaetion was felt respeeting it.

The Seetion determined to address the Colonial Offiee on the subjeet, since, while reeognising and sympathising with every endeavour to proteet the rubber industry, it felt it necessary to protest against one clause of the Ordinanee as likely to cause mueh unneeessary friction. The following letter was consequently addressed to the Colonial Office:—

"Manchester Chamber of Commeree, "Nov. 23, 1901.

"Sir,—I am desired by the President of this Chamber to address you on the subject of the Lagos Forest Reserves Ordinanee, whieh has been under the consideration of the Afriean Seetion of the Chamber. The Section is strongly impressed by the neeessity of preserving the productive eapaeity of the rubber plant in the interests alike of the Colony and of British trade with Lagos. It is apprehensive, however, that some parts of the Ordinanee, espeeially Clause No. 1 of Section 5, are very likely to create alarm and irritation in the native mind, sinee they will almost certainly regard it as an eneroaehment on the just rights of native landowners. It is believed also that the elause requiring every native selling produee to take out a lieenee will prove a souree of diseontent. I am to suggest that before your assent is aecorded to this measure it may be revised with a view to removing all ground for reasonable objeetion on the part of the natives. I am further respectfully to express the regret of the Seetion that opportunity was not given, before the publieation of the Ordinance in the Colony, to the Home Chamber of Commerce interested in trade with Lagos to eonsider and report to you upon its terms,—I have, &e.,

"Elijah Helm, Secretary."

"The Right Hon. Joseph Chamberlain, M.P.,
"Colonial Office, London."

"Colonial Offiee, Downing Street,
"Deeember 26, 1901.

"Sir,—I am directed by Mr Secretary Chamberlain to acknowledge the reeeipt of your letter of November 11 on the subjeet of the Bill reeently introdueed into the Legislative Council of Lagos to provide for the regulation of the forests in the Colony and Proteetorate. 2. Mr Chamberlain is glad to see that the Manchester Chamber of Commerce recognise the neeessity of preserving the produetive eapacity of the rubber plants. It would, in his opinion, be to the advantage of the country as well as in the best interests of trade that the Governor should have power to regulate, not only the collection of rubber, but also the cutting of timber, as proposed in the Bill introdueed into the Legislative Couneil, but, in view of the objections taken to the manner in which it was proposed that the regulations should be enforeed, the Bill will not be proeeeded with in its present form. Mr Chamberlain hopes, however, that further diseussion will eonvince the native authorities in the Proteetorate of the neeessity of taking measures to prevent the forests from being exploited at the expense of the future, and that it will be seen that the effect of regulations sueh as those proposed would be not to encroach upon the just rights of the landowners and people in the Protectorate, but to proteet them against the operations of persons who are only interested in obtaining an immediate profit. 3. I am to add, with reference to the last paragraph of your letter, that the introduetion of a Bill into the Legislative Council is the method preseribed by the constitution of Lagos to afford opportunity for the diseussson of measures before they are passed into law.—I am, &e., "C. P. Lucas."

"The Secretary,
Manehester Chamber of Commeree."—*India Rubber Trades' Journal*, May 26.

COFFEE IN ABYSSINIA.

It is reported in letters reeeived from Harrar that Mohamed Alia Bohra, a leading merehant of Abyssinia, has obtained from the King the monopoly of purchasing coffee in Abyssinia and Harrar. Coffee sells at Harrar at 6 shillings per maund of 36 lb and the monopolist may buy it at half this rate. —*Indian Witness.*

ASSAM TEA GOING OUT OF CULTIVATION.

Read letter dated 4th June, from Messrs. Shaw, Wallace & Co., pointing out, in reference to the "Report on Tea Culture in Assam" for the year 1901, just issued by the Assam Secretariat, the large amount of Tea land which appeared to be going out of cultivation. The method adopted by the Assam Secretariat in compiling the returns was to transfer tea, which had been planted out three years, from the "immature" to the "mature" column. For instance, in 1898, the nett addition to the area under cultivation was shewn at 14,997 acres, but the increase in mature tea in 1901, as shewn by the Report was only 7 264 acres. It would thus appear that 7,733 acres had disappeared from cultivation. Mr McMorran also submitted a digest, which he had prepared from previous reports, shewing similar discripancies. It was decided to draw the attention of the Assam Administration to the differences, in the figures which had been pointed out.—*I. T. A. Minutes*, June 17.

FORESTRY AND FRUIT-GROWING IN THE ORANGE RIVER COLONY.

Bloemfontein, June 4.—Recent reports from the Government forest nursery which has been laid out near Thaba Nchu show that surprising progress has been made. Over 100,000 seedling trees, mainly eucalyptus and pine, are now ready for transplanation. Experiments have also been made in the cultivation of oak trees, of which eight acres have been planted, and the wattle area under cultivation is being continually extended. The construction of dams and water furrows is proceeding. It is intended to establish plantations generally, and wherever the Government acquires land a portion of it will be preserved for forestry.

Mr G S Scott, the Government fruit expert, will arrive in Bloemfontein next week, after spending a year in Cape Colony inspecting the method of culture adopted on Mr Rhodes' fruit farms at Pearl and the tobacco farm in the Oudtshoorn district. Recently Orange River Colony tobacco has practically replaced that of the Transvaal, although it is being sold under the latter name, and there are prospects that the industry will be most profitable. Mr Scott will later act as itinerant instructor in various districts. Similar arrangements will be made in other branches of agriculture in the future.—*Laffan.*

INDIAN TEA FOR PERSIA: A FAILURE.

The Holta Company report considerable disappointment in the attempt to exploit the Persian market following on the representations made to the Indian Tea Association last year. The Directors say: A consignment of 10,065 lb was sent to Persia by caravan *via* Seistan. With reference to this, we may mention that we joined with other large proprietors in the valley in equipping a caravan for Persia. We were led to suppose that tea would meet a ready sale in Persia at prices which would give a very much better return than those obtainable in either the Calcutta or London Market. We regret to say that these hopes have not been realised, and we are afraid we shall not get much more than will cover cost of production and transport to Persia. The tea is as yet unsold, but the agent in charge has instructions to sell as quickly as possible, and return. *Indian Gardening and Planting*, June 26.

PLANTING NOTES.

Wire Tramways.—An interesting paper on Wire Tramways by Mr. W. R. Shaw, M. E. (Queen's) M. Inst. C. E., Consulting Engineer for Railways, Bombay, is reproduced on page 111 from the *Indian and Eastern Engineer.* We invite the attention of our readers to the article.

Spineless Lime Trees.—In 1892 on Shawford estate, Dominica, a lime tree was noticed without the usual formidable spines. Seeds from this apparent 'sport' were collected and sown. Some 75 per cent came true and a plot of spineless limes forms an interesting feature in the Dominica Botanic Garden. The plants in this plot are now bearing heavily and the Curator, Mr Jones, reports that 80 to 90 per cent of the seedlings raised are coming true. The fruit of the spineless variety is slightly below the average in size, and it remains to be seen whether, for estate requirements, the new variety is an improvement or not.—*Agricultural News*, May 24.

Lagos Silk Rubber at Tobago.—A plot of the African or Lagos silk rubber (*Funtumia elastica*) was planted at the Botanic Station, Tobago, in April 1901. The Curator reports that the plants have made good growth and flowered for the first time this month. Mr Millen adds that in a young state the plant assumes a shrubby habit, but by pruning it can be made to form a trunk. In Lagos it attains a height of from 90 to 100 feet before branching. This makes it easy for the collector to tap the trunks. The latex flows readily and rubber is easily produced by the hot and cold water process, no chemicals being required as in some rubber-producing trees. From its rapid growth the tree is apparently adapted for cultivation in Tobago.—*Agricultural News*, May 24.

Coconut Palms—are growing apace in the Kelani Valley (and so is Rubber); but porcupines are reported to be a terribly troublesome enemy, entailing much expense in watchmen. Do planters know of the Sinhalese trench traps for porcupines? When well baited, they are generally successful and all Sinhalese villagers must know the plan.

A U.S.A. Expert on Rice-growing in the East.—Professor S. A. Knapp, President of the Rice Association and Special Commissioner of the Department of Agriculture, United States, who was sent to Asia and the Pacific Islands to investigate the rice industry and learn what varieties were best adapted for cultivation in that country, recently made a report to the Secretary of Agriculture. Professor Knapp visited Japan, China, the Philippines, Hawaii, Siam, Ceylon, India and Burma. In speaking of his investigations, he said:—

"The United States can profit from the experience of the Oriental countries in the varieties of rice, but nothing can be learned from them in the cultivation of the plant. What the United States needs is the introduction of more early varieties of rice. I do not think the United States has anything to fear from Oriental competition."

Tea in Russia.—The Dutch Consul at Warsaw has been giving the imports of tea into Russia as follows, we changing his kilogrammes into lbs.:—

Total import, over ...		116,600,000 lb.
Brick tea =	75,680,000	
Black tea =	39,600,000	
Tablets tea =	2,145,000	
Green tea =	672,000	
Yellow tea = (*small quantity*)	=118,097,000	

We are not responsible for the discrepancy. The estimate of Brick tea is singularly near that of the Shanghai Tea Committee some years ago, which was 76,949,200 lb.; and Green tea was given (shipped to Batoum) at 631,733 lb.; but the estimate of black tea was much larger or 45,179,066 lb.—a good deal of which may have been for Central Asia and adjacent lands. The grand total of the Shanghai estimate was above on 133 millions lb.; and it is more likely that with Ceylon and Indian tea now (and perhaps less China), some 150 millions of lb. of tea must be taken in a year, by Russian merchants or on Russian account, to supply the markets not only of Russia in Europe and Asia, but the adjacent territories which have their tea requirements met through the Russian trade routes. We simply go on the fact that a Tea Sub-Committee of Shanghai Merchants —who must have known what they were about—gave detailed figures showing that in 1896 Russia had taken, by four different routes, 132,567,866 lb. of tea from China. This was apart from Indian and Ceylon tea sent direct or *via* London—so that the total demand was not then much under 140 millions lb. In the past six years in a tea-consuming country like Russia there must be a steady if slow increase in the imports, so that we do not think 150 millions lb. can be an over-estimate of the total requirements, in all kinds of tea, at the present time.

A CALCUTTA INTERVIEW WITH MR. DRUMMOND DEANE.

HIS OPINION ON CEYLON TEA AFFAIRS.

While Mr Drummond Deane, the well-known Ceylon and Travancore planter, was in Calentta last week, a representative of this journal took the opportunity of eliciting his views on tea subjects generally. Mr Deane in reply to questions said :—

"Coming to Ceylon affairs," he said, "do you think it is practicable to amalgamate Indian and Ceylon interests in a joint campaign as has been suggested ?"

"Well, I think in the present state of tea they are practically identical. The present sluggishness of Indian tea on the markets is a distinct clog upon Ceylon. The weight of Indian tea on London adversely affects Ceylon prices in the market to which the greatest part of her crop is still sold. So, considering that Indian progress is evidently fated to be slow for some time yet to come, I think it would be wise of Ceylon to come forward and help what some people call her rival out of the ditch, if possible. It is a question from which sentiment should be excluded; the question Ceylon planters have to ask themselves is whether India will not do them more harm by wallowing in that ditch and bringing down tea prices generally than by getting on her legs by drawing off a certain proportion of the good of Ceylon efforts. I am not sure that it would not be sound policy to include Java in a general scheme of mutual help. I certainly advocate a combined movement for India and Ceylon. Of course, in the present state of Indian finances the Ceylon people would be bound to think that we in India were trying to get too much out of them, but if left to herself, so far as I can see, India will cause a greater loss to Ceylon by overloading London, and so bringing down tea prices. And in this last contingency no one at all will profit."

"How are Ceylon men likely to view this?"

"Well, perhaps they are hardly educated up to it, though some of their leaders believe in it. In the Green Tea development alone there have been some very unsound views put forward with regard to India and Ceylon. It was considered as a sort of injury that India should take up this industry which Ceylon had started. Now this is capable of being turned to the real benefit of Ceylon planters. Every pound of Green Tea made in India leaves a chance for another pound of black tea made in Ceylon. The island cannot develop the whole of the Green Tea market in America. Taking it at that alone, there is enough room and to spare for both countries. But Ceylon has not enough of tea lands suitable for the Green Tea development. After producing about 10 million pounds Ceylon would have to stop, while India at a moderate computation has land on which Green Tea cultivation is advisable sufficient to produce four times as much. The qualities of Green Tea in favour have little strength. In Japan the flushes come on so rapidly during the short season that they are only fit to produce a washy sort of tea, the Indian bheel gardens of Cachar and Sylhet especially are, I am sure, just fitted to produce these qualities, and have the additional advantage that they can be worked at a very cheap rate, and also a practical inducement that, however tea may recover, these gardens with their heavy flushes of watery leaf will never attain high prices for their black teas. Now in Ceylon with any recovery in tea prices brought on, say by increased Green Tea production lightening the black tea market, it will pay Green Tea producer except in a fairly small proportion of acreage to return to black tea. Therefore I consider it would be to the real benefit to Ceylon proprietors to actually induce India to go in for Green Teas as she is more likely to stick to the manufacture and thus make a permanent withdrawal of a percentage of tea from the black tea market."

"You advocate, then, a joint propaganda between India and Ceylon in America in green tea as well as black ?'

"Certainly, though India has not much money at present to help, it would be well for Ceylon to let her do as much as she can in the joint effort and to supply the deficiency, including Indian tea in Ceylon advertisements for a contribution as great as circumstances will admit. Even if India gets her Cess she will still be behind Ceylon in the matter of money. This might seem too unselfish a course to follow to most, for selfishness and exclusiveness are rather prevalent; but I believe it is unselfishness that would pay Ceylon in the end."

"Well, Mr Deane, it may come off, but certain people in Ceylon will need a deal of persuasion. What, for instance, do you think of Mr Rosling's remarks on the subject of the Indian Cess, contributed last year to the Colombo press, where he wrote that it was not to Ceylon's interest that India should get her Cess?"

"I think he was so obviously wrong and short-sighted that it is quite sufficient to leave it to the intelligent reader to pick out the fallacy for himself."

"To sum up the present situation, what do you consider we immediately need?"

"At present we can only hope for the Cess to give us a chance to work off our surplus; another thing which would relieve us we are, it seems, not likely to get—reduction in exchange. The present artificially inflated rupee presses hard on those who sell produce from India. With regard to the Cess, we ought to have the sympathy of the Viceroy, because, if I remember right, it was he who, when addressing the Assam planters, impressed upon them the necessity of helping themselves by getting off their tea on new markets, and the Cess movement is nothing but the practical embodiment of the policy he advocated and recommended. The Cess, however, will be a serious responsibility upon those who administer it, and I trust that London will not get a preponderating influence, or there is no saying what things we shall see. Every district in India should be fully represented on the model of the Ceylon Thirty Committee and by men whose chief interest does not lie in tea trading to London particularly but who are devoted to the growing of tea and its disposal in the most judicious manner possible, no matter on what market; a body in fact who can be trusted to take care of the general interests of tea growers without any leaning to any particular trade."—*Indian Gardening and Planting*, June 26.

CEYLON COCOA IN GERMANY.

A HINT FROM MR. RENTON.

Ceylon cocoa growers will feel grateful for the keen interest displayed in their interests by Mr. Renton. Today through the courtesy of Mr. Philip we are enabled to publish a hint which Mr. Renton sends to cocoa growers in Ceylon and which is specially applicable to those who export their produce to Germany. A valued correspondent with considerable knowledge of the subject gives us the following information of interest:—"The washing of cocoa and consequent removal of mucilage is pretty general in Ceylon, though there are, I understand, two or three estates where cocoa is not washed and mucilage is allowed to dry on the bean. I sent a sample of cocoa home some weeks ago, with mucilage dried on. Brokers reported "dark stained skin, good brownish *break*, well fermented and of even colour. The dark stain on skin would prevent its sale on type. Bright fiery skin is preferred, and, if this can be obtained, coupled with 'break' same as sample, a fancy price might be secured." I do not suppose it is possible to get the bright appearance when the slimy mucilage is dried on the bean. Of course, if buyers generally began to realise that the "break" of the dark-skinned beans was always better, the fiery skin would cease to attract. Fiery skin has hitherto, I expect, generally indicated probable good "break." Enclosed are 2 samples: A, washed, B, unwashed. The latter has suffered in the keeping somewhat but not a great deal." (To the unpractised eye at any rate the washed beans look the most attractive.) What Germany wants, it is evident from the above, is not wanted at home. It would be interesting, however, and would save others experimenting, if some of those who export "unwashed" cocoa would give their opinion on the extract sent by Mr. Renton.

COMPRESSED TEA TRADE OF RUSSIA.

According to the Dutch Consul at Warsaw more than 53,000,000 kilogs of tea are annually imported by Russia, of which 34,400,000 kilogs consist of brick tea, 18,000,000 kilogs of black tea, 975,000 kilogs of tablets, and 280,000 kilogs of green tea. A small quantity of yellow tea is also consumed, which, however, is too insignificant to be taken into consideration. Green tea is rarely found in Russian households, and the great majority of Russians have never tasted it.

TEA IN TABLETS.

These tablets are manufactured with tea leaves of inferior quality. They are 130 millimetres long, 40 wide, and 20 thick, and each tablet is divided into eight sections. The tablet weighs ¼ lb (Russian) and is enclosed in paper bearing the name of the manufacturer. For packing purposes tin-lined cases, each containing 126 Russian lb, are used. The retail price at Moscow is 1 rouble 10 copecks per Russian lb (about 2·7d per English lb). All the tablets used at Warsaw bear the name of a firm at Hankow.

BRICK TEA.

Brick tea is also manufactured at Hankow. There are two qualities, the first quality measuring 227 millimetres long by 160 wide and 11 thick, and weighing ½ kilog each. Bricks of the second quality measure 287 by 183 by 22 millimetres, with an average weight of 1·160 kilogs.

These bricks are packed in wooden cases, holding from 216 to 240 lb (Russian). The retail price at Warsaw is 70 copecks per Russian lb (about 1s 8d per English lb) for the first quality, and 60 copecks (1s 5d) for the second quality.

NOTE.—Kilog=2·2 lb. Millimetre=·03937 inch.
—*Chamber of Commerce Journal.*

FARMING IN ORANGE RIVER COLONY.

Bloemfontein, June 24.—Among the officials of the Orange River Colony Agricultural Department the opinion is held that it will be of the gravest importance for the success of this agricultural country that the class of intending settlers shall be most carefully selected, preference being given to real working farmers and men with families who can till with their own hands and be independent of outside labour. To such settlers large incomes will undoubtedly accrue. Land for settlement purposes is being acquired each week, and it is expected that farming will quickly become one of the most important industries of the Orange River Colony. Hitherto nine-tenths of the milk produced has been wasted, but now every cow is producing, and half is being turned to account.

With reference to the re-stocking of the colony with cattle, it has been found that more cattle are still in the country than was generally believed. If the supply, however, locally fails, it is thought that the competition between oversea colonies will be so great that prices cannot be exorbitant. On account of the deaths among the young that occur in imported stock the local supplies will be drawn upon as far as possible. At least half the quantity required, about half a million, for re-stocking the Orange River Colony is now in sight. The majority of the farmers will arrive on their farms in time for spring ploughing and sowing, and it seems likely that the country will not take a great time to recover its normal state. A large quantity of tobacco will be planted in all suitable districts in the coming season. Poultry clubs, under the presidency of Major Goold-Adams, are being formed in most of the districts, as the importance of poultry for producing a rapid supply of food is realised.—London *Times*, June 28.

TEA OVER-PRODUCTION AND THE LONDON MARKET.—A more feasible and desirable means of meeting the evil of larger supplies of tea being thrown on the London market at times than can secure fair prices, than any yet proposed, is an Indian and Ceylon Financial Combination of producers to enter the market as buyers and holders of tea whenever there is an over-supply. The object is to secure a more even distribution of the tea offering for sale, the purchases being made by the Combination to be re-offered at sales when the supply was less. We are assured on good authority that such a Combination is likely to be matured and got to work erelong.

THE TEA DUTY BEFORE THE HOUSE OF COMMONS.

The sitting of Tuesday, June 10th, was resumed at 9 o'clock. On Clause 2 (Duty on Tea), Mr FLYNN (Cork N) moved an amendment to exempt Ireland from the duty. The duty on tea fell on the poorer country with greater severity than on the richer; indeed, tea and maize formed more than 50 per cent of the expenditure of the poorest families in Ireland. He also claimed that the exemption he asked for would tend to equalise the balance between direct and indirect taxation as regards the sister isle.

The CHANCELLOR of the EXCHEQUER said that his experience in this country was that the poor were more particular about the kind of tea they bought than other people, and probably it was the same in Ireland. (Hear, hear.) He could not assent to the suggestion of the hon. member, and as he was engaged in raising taxation he regretted to say he must oppose the amendment. He did not think that the Budget resolutions had any bearing on the subject of the financial relations between the two countries.

Mr T W RUSSELL said that he did not understand that the question of the financial relations had been raised by the hon. member opposite. So far as he was concerned he was pledged to vote for any money that the Government required for the war. He would personally be glad to vote for the abolition of the tea duty all over the country, but if his hon. friend went to a division he should be compelled to vote against him.

SIR T ESMONDE (Wexford, N.) thought that under the special circumstances the burden on Ireland should be reduced.

COLONEL LOCKWOOD (Essex, Epping) said that though there was no doubt that many on his side of the House had, generally speaking not much sympathy with the views expressed by hon. members from Ireland opposite, they had during the last three or four nights felt considerable sympathy with the poor people in Ireland who would undoubtedly suffer from the incidence of this tax. He thought, however, that the hon. member for North Cork would see that it would be impossible to draw a line of demarcation between England and Ireland in this matter.

The Committee divided, and there voted—

For the amendment	...	69
Against ...	...	138
Majority against	...	—69

Mr CHANNING proposed an amendment REDUCING THE DUTY ON TEA TO 4D. PER LB. He said that figures furnished to him by one of the ablest co-operators in the country showed that an enormous contribution, as expressed in terms of income-tax, was made by the working classes towards the public revenue in respect of breadstuffs, tea, sugar and tobacco. One working class budget of 35s a week showed a total indirect contribution *ad valorem* on these four articles of 19d in the pound, expressed as income-tax; in another case the amount was 24·8d in the pound. He contended that there was a strong case for making a reduction in the tea duty.

The CHANCELLOR of the EXCHEQUER thought there could be no question that, having regard to the expenditure of the year, they must retain the taxes as they stood last year. Taking the whole of the country, he could not see what possible grounds, there were for this amendment. He passed by what the hon. member said as to the sugar duties, but with regard to the tea duties there had been a very considerable yield in the past year. This was very clear proof that the great bulk of the population continued to indulge in tea even to a greater extent than before. And why? Because, although the tax had increased, the price of tea had fallen. He considered that the proposal of the hon. member to reduce the tea duty was unjustifiable.

Mr E ROBERTSON (Dundee) said the great objection which they had to this kind of tax was that it fell upon a large section of the community who were unable to bear any burden at all.

Mr MCKENNA (Monmouthshire, N.) said he should vote for the reduction of every indirect tax until they had absorbed the surplus of £6,000,000 which the Chancellor of the Exchequer possessed, and the tax on tea should find a first place among the taxes to be reduced.

Mr BROADHURST supported the amendment.

Mr HEMPHILL (Tyrone, N.) said there was no tax which pressed more unfairly upon poor people in Ireland than the tea tax. Tea was becoming one of the first necessaries of life among the poorest people in Ireland. Where formerly potatoes and milk were consumed, the fare in many Irish dwellings was now grilled cake, made of Indian corn, supplemented by tea. Equality of taxation meant equality of sacrifice. It was absurd to talk of maintenance of the proportion of direct and indirect taxation. The first duty of every Government was to see that none of the inhabitants of their country were dying of starvation, and if they taxed the first necessaries of life this involved more or less starvation, or the workhouse as the alternative of starvation. There was no necessity for this taxation since the announcement of peace. The first duty of the Chancellor of the Exchequer when peace was assured was not to repay the Sinking Fund, but to relieve the poor of these burdens on the necessities of life.

Mr BRYAN ROBERTS (Carnarvonshire, Eifion) could not support the amendment. The tax reached a class which but few of the other taxes reached—the Nonconformist teetotallers. (Laughter.) These gentlemen ought not to escape any of the burden of war taxation. This tax was different from the corn tax inasmuch as it had no taint of protection about it.

Mr G WHITE (Norfolk, N. W.) protested against the tax on behalf of the agricultural labourers. In his opinion an undue burden of taxation had been placed on their shoulders as a result of the war.

Mr CHANNING complained that the Chancellor of the Exchequer had evaded the point established by the trustworthy figures he had given, that the portion of this tax paid by the poorer classes was far in excess of that paid by the wealthier classes.

The CHANCELLOR of the EXCHEQUER would not admit that it was so, but whether it was so or not there was no question that the amount paid to the revenue by indirect taxation was far less than the amount paid by direct taxation. At the present time there was no ground for this reduction.

MR. T P O'CONNOR (Liverpool, Scotland) regarded this duty as one of the worst and most illogical forms of taxation, and especially oppressive to the poorer classes. Accepting the principle that taxation should be spread over all

classes there was still the limitation that the means of bare livelihood should not be touched, a limitation recognised in the income-tax exemptions. Tea ought to be excluded from the operations of the Chancellor of the Exchequer. In the slums of London and in the congested districts of Ireland it was one of the main articles of food. Yet it was not only heavily taxed but the tax was levied unequally, being imposed alike on tea at 3s 6d and tea at 1s 6d per lb.

Mr. Lough (Islington, W) said that if the financial position had remained unchanged since the introduction of the Budget he would not have supported the amendment. But he supported it because the Chancellor of the Exchequer, with his surplus of £6,000,000, could easily spare the £2,000,000 which would be taken off the taxation by the acceptance of the amendment.

Mr. J Dewar (Inverness) said he was unable to support his hon. friend on this occasion, as he thought the Chancellor of the Exchequer was taking up a sound position in refusing to remit this taxation. He opposed the corn tax, but the tea tax was in a very different position. As to the incidence of taxation, he maintained that indirect taxation bore very unfairly on men with small incomes.

Mr. Groes (Salford, S) said the Chancellor of the Exchequer was applying first business principles to the consideration of this question—namely, that one should pay off debts before contracting liabilities, and be just before being generous. (Hear, hear.)

Mr. J A Pease (Essex, Saffron Walden) supported the amendment, believing that they would be wise if they called upon the agricultural labourers, as well as other classes in the community, to pay by a system of direct rather than by a system of indirect, taxation.

The Committee divided and the votes were—For the amendment 137, Against 229, Majority against —92.

Mr Lough moved to insert after the word "sixpence" the word "net." He said that the tea duty was not really sixpence, but sixpence with an addition of ½ per cent to cover the cost of collection. This charge had been abandoned in respect of every other duty, and no reason could be given for its maintenance in regard to tea.

The Chancellor of the Exchequer said that the hon. member had confused two totally different things. There was a small warehousing charge of ½ per cent. on all classes of goods which had continued for the last 40 years without complaint. If the hon. member had any particular grievance in regard to tea, it should be inquired into.

The amendment was by leave withdrawn, and Clause 2 was ordered to stand part of the Bill.—London *Times*, June 14.

RUBBER IN PERU.

THE DIFFICULTIES OF TRANSPORT.

Vice-Consul Robilliard, in a report from Mollendo (Peru) states that the rubber industry still occupies a good deal of attention, and although the quantity shipped this year only exceeds last year's output by 15 tons, this is accounted for by the fact that large quantities are being prepared in the interior ready to ship when the dry weather sets in—from the beginning of April. A few remarks on the difficulties that attend this industry may be of interest. From the time of landing here about 15 days will be occupied in travelling by train, steamer, mule, and canoe to get to the rubber districts. The first range of the Andes has to be crossed at 17,500 feet above the level of the sea before the descent into the valleys can be effected. Sorata, in Bolivia, is the place at which nearly all the roads into the rubber and mining districts converge. The traveller will often be delayed for several days, as all the owners of beasts of burden take advantage of the scarcity of the means of transport, and extort the highest possible freights for their animals. Once work has been started, the cheaper plan is to buy mules and horses. All supplies have to be carried in, as scarcely anything can be purchased there. However, stores are gradually being established on the different claims. The descent is very dangerous in some places the incline being from 30 to 45 degrees, and the animals often slip and are thrown over the precipices. This part of the road 23 miles in length, takes 12 hours, when Pararani is reached, 4,600 feet above sea level. From Pararani to Mapiri the road is more practicable, and rubber, Peruvian bark, and coffee plantations are met. Mapiri is the centre of these regions, and from there one strikes off to wherever the claims may be. At least 90 per cent of the travellers fall sick with malarial fevers, more or less intense, although seldom fatal. From Mapiri, Guanay is reached in canoes, or rafts made of nine sticks fastened with vines; three of these rafts formed what is called a callopo, capable of carrying 1½ tons of cargo. The distance is 62 miles and can be done in one day, going down stream, but coming back it takes three days, the current running six miles an hour. The Indians can only pull at the rate of 1½ mile per hour. From Guanay there are roads that lead to the placer mines on the rivers Tipuani, Covahuira, Challana, etc, in which regions gold is found in abundance, but machinery is badly required, especially to dredge the rivers.—*M. Mail*, June 28.

RUBBER IN PORTUGUESE E. AFRICA.

Beira.—Exportation of india-rubber shows an increase on previous years, but this is mainly due to the action of the Mozambique Company in employing a large number of natives to tap the country in every possible direction for this particular article of commerce, by which they have no doubt injured this resource for many years to come.—*India-Rubber Journal*, June 9.

DUTCH COLONIES.

The following statistics are taken from the *Indische Mercuur*, of 30th May last:—

THE DUTCH EAST-INDIES.

Area: 735,000 square English Miles. Population: about 29,000·000.

Agricultural Estates: coffee 836, tobacco 410; sugar 254; sugarbibit 141; indigo 176, cinchona 131 tea 112; spices 215; rice 430; cocoa 173; coconuts 289; groundnuts 53; kapok 92: cassave 12; guttapercha 40; timber 122, coffee hulling-mills 18; rice hulling-mills 53 sundries 61. Mining: grants up to January 1902: 205. Railways: Govt., length about 2,622 miles, private 6,205. Steam-tramways: Govt. 38 miles; private 1809,5. Capital: joint stock, £99,000.000, (besides capital in private commercial and industrial enterprises).

SURINAM.

Area: about 58,000 square Engl. miles; pop; about 68,000. Agricultural estates: cocoa 84, coffee 58, sugar 9; bananas 71, sundries 87. Capital; joint stock £3,000,000, (beside capital in private commercial and industrial enterprises).

WIRE TRAMWAYS: THE KANAN DEVAN, TRAVANCORE.

BY W. R SHAW, M.E. (QUEEN'S), M. INST. C.E. (*Consulting Engineer for Railways, Bombay.*)

[The following is from a paper in the "*Indian and Eastern Engineer*" for June, 1902, accompanied by two pages of (or five) photographs.—Ed. *T.A.*]

There are undoubtedly several places in India where a wire tramway would pay handsomely, and yet there are very few of these useful lines in the country. One reason for this is that capital is not over-plentiful, while labour is wonderfully cheap and the cost of carriage is low. Then, again, there are not many of these lines in England, so the engineer or planter who takes any interest in the subject is obliged to pick up his knowledge laboriously from various foreign technical papers.

Within the last year or two, however, there has been a decided advance in the subject of wire tramways in India. One promising line in Assam is now under consideration. A bold scheme has been outlined to connect Bengal and Thibet by means of a line 40 miles long over the Jalap La Pass, 17,000 feet high, to secure the wool traffic.

The present paper will give some of the main features of an unusually interesting wire tramway in North Travancore, which has been working now with the greatest success for the last eighteen months. The writer is indebted to Mr W Kemlo, the engineer who so successfully designed and constructed the line, for most of the following details and for the highly interesting set of photos.

The tramway is designed for the conveyance of stores and produce to and from a large estate in the Travancore Hills. It is divided into two practically equal sections, each over one mile long, and rises about 4,000 feet. When the scheme is complete there will be a branch line from the South Indian Railway to the lower station, and the upper station will be joined up with a 40-mile mono-rail tramway leading to the estate.

The route follows an old cooly track, and there were great difficulties in the setting out of the line on account of the feverish nature of the country in the lower section; in fact the climate was so bad that the home firms who were prepared to supply the materials would not undertake the work of erection, and it was finally decided to design and erect the line locally.

The line is on the running-rope principle. The two sections are geared together and are driven from a central station. The following are the details of the sections:—

		Vertical rise.	Horizontal distance.
Upper Section	...	1,745	5,700
Lower Section	...	2,187	7,563
Total	...	3,932	13,263
Longest span	..	427	1,533
Steepest span	...	246	558

Total length along rope 2·62 miles. In the upper section there are eight intermediate standards and twelve in the lower.

Two standards are about	...	40 feet high.
Remainder	...	13 do

THE ROPE.

The rope is ¾ inch diameter, best plough steel, hemp core and weighs 1 lb per foot run. It was sent out in eight pieces, each over 3,000 feet long, coiled on a drum. The drums were fitted to a locally-made stand, and the wire was hauled out by block and tackle and spliced on the spot.

THE GRIPS.

The grips on a line of such steep grades require to be very strong. Those in use were locally designed and will be patented. They grip the rope at any point automatically, go up to the top of the section, automatically leave the rope and run unto the shunt rail and are said to be a success in every way. The line is only meant for goods traffic, but if the grips are so reliable there does not seem to be any reason why passengers should not be also carried inspecially-designed carriers to hold one or two persons.

POWER.

Water-power is obtained by an 8-inch steel pipe, giving a fall of 720 feet, connected to two Pelton wheels. Each Pelton drives a dynamo capable of giving 40 amperes at 500 volts. This power is transmitted to the centre station, 1,850 yards distant, by two copper wires. The two sections of the tramway are driven together at the centre station by one or both of two motors similar to the dynamos at the power station below. At the centre station the gear is arranged to drive the ropes at one, two or three miles per hour. The rope has been worked at three miles an hour, but at present it is worked at two miles an hour, as this speed is sufficient for the traffic at present. About 20 H.-P. is sufficient to drive the line when the loads are uphill.

RESULTS.

The tramway has been working nearly continuously since August 1900 ten hours a day. About 40 carriers are used on the rope and all kinds of goods are carried, the load varying from one to three hundred weights So far the greater part of the traffic has been up, but the down traffic is steadily increasing as the estates are coming more into bearing. Three round trips can be made in a day, giving eighteen tons of traffic or for a year of 350 days say 6,000 tons. The traffic was formerly carried by some 5,000 ponies, bullocks and donkeys, and it is estimated the line will save at least £1 per ton, or £6,000 a year, so that the line is in every way a success.

NEW INDIAN TEA PATENTS.

The 5th December, 1901—Specifications of the undermentioned inventions have been filed:—

No. 162 of 1901, Andrew Gilmour McMeekin, Tea Planter, of the Allynugger Tea Estate, Shamshenugger. South Sylhet, British India. Improvements in tea-firing machines. (Specification filed 22nd November, 1901).

No. 163 of 1901, Thomas Aubrey Hunt, Engineer and Tea Planter, residing at the Lackatoorah Tea Estate, Sylhet, in British India. A marker for keeping the score at the game of "Bridge." to be called the "Simplex Bridge Marker." (Specification filed 22nd November, 1901).

No. 182 of 1901, James Begg, Tea Planter, of Hoolungorie Tea Estate, Assam, in British India. A new or improved machine for artificially withering tea leaf. (Specification filed 22nd November, 1901.—*Indian Engineering*, June 21.

TEA SALES.

PUBLIC SALES OF TEA IN COLOMBO.

DURING THE SIX MONTHS ENDED JUNE 30TH, 1902.

Date.		Offered	Sold	Avg. 1902.	Avg. 1901.	Exchange Demand Drafts 1902.
		lb.	lb.	c.	c.	s. d.
Jan.	3	1,493,593	1,020,013	34	27	1/4 1-32
,,	8	646,988	565,268	36	31	1/4 1-32
,,	15	1,120132	752,067	34	29	1/4 1-32
,,	22	1,375,393	1,050,692	33	27	1/4 1-16
,,	29	930,113	600,060	32	27	1/4 1-16
Feb.	5	784,641	591,461	33	30	1/4 1-32
,,	12	768,910	651,783	34	29	1/4 1-16
,,	29	1,011,108	775,306	34	29	1/4 1-16
,,	26	891,360	680,597	35	30	1/4 1-32
Mar.	5	847,998	684,470	36	34	1/4 1-32
,,	12	839,768	685,687	37	35	1/4
,,	19	1,176,128	941,572	36	36	1/4
,,	25	1,097,693	813,233	35	37	1/4
April.	9	1,697,525	1,535,020	36	39	1/3 31-32
,,	16	1,223,215	1,077,853	37	35	1/4
,,	23	1,015,491	799,986	36	33	1/3 31 32
,,	30	1,079,592	906,717	36	31	1/3 31-32
May	7	1,104,239	848,091	35	32	1/3 31-32
,,	14	1,285,620	839,487	34	30	1/3 15-16
,,	21	1,455,916	1,018.149	33	29	1/3 15-16
,,	28	1,474,765	833,098	31	27	1/3 15-16
June	4	1,523,104	1,169,815	30	31	1/3 15-16
,,	11	1,318,660	953,845	30	32	1/3 15 16
,,	18	1,472,731	1,180,630	30	32	1/3 15-16
,,	24	1,170 659	740,607	30	31	1/3 15 16
Total ½ 1902		28,805,342	21,715,507	33	32	1/4
Do 1901		26,620,270	19,872,871	...	...	...

PUBLIC SALES OF TEA IN LONDON.

DURING THE SIX MONTHS ENDED JUNE 30TH, 1902.

Date.		Packages Offered.	Packages Sold.	Reuter's Average. 1902.	Gow, Wilson and Stanton's Average. 1902.	Gow, Wilson and Stanton's Average. 1901.
Jan.	2	11,000	9,000	7½	7½	7
,,	9	21,000	20,000	7¾	7½	6⅝
,,	16	32,000	29,000	7⅜	7⅜	6½
,,	24	26,000	24,000	7½	7½	7½
,,	30	27,000	25,000	7¼	7¼	6¼
Feb.	6	28,000	24,000	7	7	6
,,	13	26,000	23,000	7	7	6
,,	20	23,000	22,000	6⅞	6¾	6⅜
,,	27	26,000	24,000	7⅛	7⅛	6½
Mar.	6	21,000	20,000	7⅛	7⅛	6⅝
,,	13	25,000	23,000	7⅛	7	6½
,,	20	23,000	21,000	7⅛	7	6¾
,,	27	25,000	22,000	7	7	7
Apr.	10	27,000	25,000	6⅞	6⅞	—
,,	17	28,000	26,000	6⅞	6⅞	7¼
,,	24	24,000	19,000	6⅝	6⅝	6⅞
May	1	20,000	17,000	6½	6½	6⅝
,,	8	28,000	25,000	6½	6⅝	6⅜
,,	15	27,000	24,000	6⅝	6¾	6⅝
,,	29	30,000	25,000	6¾	6⅝	6½
June.	6	31,000	28,000	6¾	6⅝	6½
,,	12	30,000	28,000	6⅝	6⅝	6⅜
,,	19	27,000	25,000	6½	6½	6¼
,,	27	27,000	23,000	6¼	6¼	6¾
Total ½ 1902...		613,000	551,000	7	7	6¾
Do 1901...		646,000	583,000	..		..

[The figures for Local Sales are compiled from the weekly circular of Messrs. Forbes & Walker, while those for London Sales are from the telegrams received weekly.]

DOES THE MOON INFLUENCE VEGETATION?

In some countries, for example in the tropics, the bright moonlight is supposed to stimulate the growth, and it is believed that wood cut when the moon is waning from the full is apt to rot, perhaps because it has then more sap. M Bassieres, in the "Revue des Cultures Coloniales," from experiments made in Colombia, finds that phases of the moon do not seem to influence vegetation, but he asks for experiments to be made elsewhere in order to settle the question.—*Globe*.

VACCINATION FOR PLAGUE, CHOLERA AND TYPHOID.

A NEW PROCESS.

MM Roux and Besredka have brought a new process of vaccination against plague, cholera. and typhoid before the Académie des Sciences, Paris. Prevented serum injected into the blood of an animal only immunises it for a short time. On the other hand, if microbic bodies are injected, a longer immunisation is obtained but the animal does not feel well. M Besredka has combined these two existing methods by injecting a mixture of serum and microbic matter. The result is a prompt and lasting immunisation without discomfort to the animal.—*Globe*, June 13.

PERSIAN GULF PEARL FISHERY.

The season of the pearl fishery has just commenced in the Gulf, and Koweit people are very busily engaged in sending their boats. Koweit sends about 350 boats annually to the pearl fishery. Bahrein sends about 500 boats. Cassimin Thani of El-Bedaá, on the coast between Koweit and Bahrein, sends about 200 boats. There are besides those sent from Oman and the coast beyond. The pearl fishery commences in the Gulf in June and finishes at the end of September.—*M. Mail*, July 2.

ARTIFICIAL PROPAGATION OF OYSTERS.

Experiments of a somewhat remarkable character have recently been made at the John Hopkins University (U.S.A.) in the artificial propagation of oysters. A single female oyster of average size "lays" about 16.000,000 eggs, while a large specimen will produce from 30,000,000 to 40,000,000 eggs. The eggs are microscopic in size and an ordinary tumbler will hold about 100,000 eggs. Under natural conditions the eggs and milt are simply set free in the water of a river or bay and permitted to take their chances of coming together, which are so small that about one egg in a million is fertilised. The scientific manner is to open an oyster which is ready to spawn, and with the deep part of the shell downwards gently stroke, with an ordinary glass pipette, the upper surface away from the hinges, and should it be a female oyster it will pour out a fluid which will be full of eggs. In a tumbler of sea-water are placed a few drops of this liquid, to which is added a drop or two of this liquid similarly obtained from the male oyster, and fertilisation at once takes place. In about two hours afterwards all the eggs in the tumbler have been hatched, and in a few days' time they are ready to be placed in the water, and to attach themselves to some permanent object.—*Chamber of Commerce Journal* for June.

NEW TEA PATENTS.

ONE FROM MR. JAS. WHYTE, COLOMBO.

"Necessity is the mother of invention." The necessities of the tea growing business seem to be bearing the usual fruit. We have already noticed one or two developments which bid fair to become important, Mr C R Newton's enzymes and the soluble tea devised in Ceylon. The weekly reports of the Patent Office contain several others. Last week's list of patents applied for include a tea-drying and glazing machine, for which Messrs David Reid and John Dale of Baraoora, Sylhet, apply for protection. An improved method and apparatus for manufacturing green tea, patent applied for by Messrs Horace Drummond Deane and Charles George Landseer Judge. Improvements in apparatus for cutting teas sought to be patented by Mr James Whyte of San Sebastian, Colombo, Ceylon.—*Indian Gardening and Planting*, July 3.

INDIAN REDUCTION OF TEA CROP.

The local Committee of the Indian Tea Association have issued the following Circular to all producers of Indian tea :—

"We enclose copy of resolutions which were come to at an influential Meeting of Producers representing over 100 million lb. of Indian Tea, and shall be glad to know if you will join in the movement, and if so, please signify your approval on the annexed sheet, and return to the Secretary of the Indian Tea Association. You will doubtless recognise the importance of an early reply. Although it may be necessary to take the leaf off the bushes during the specified period, the undertaking provides that such leaf shall not be made into Tea from the 1st to 21st August inclusive." Later advices from London state that the London Committee have agreed to allow reduction of black tea crop by the manufacture of Green Tea, thus saving the leaf, if desired by growers. Producers who approve of the resolution for Restriction of Output, and agree to join in the movement on the terms named are asked to declare the amounts of their total estimates of crop for the current season and their outturn from the 1st to 21st August of last year.—*Indian Gardening and Planting*, July 3.

RAISING TOBACCO IN PENNSYLVANIA.

The Pennsylvania Board of Agriculture has decided to experiment in Pennsylvania with the raising of Sumatra and Cuban Havana tobacco under cover, and the eyes of tobacco raisers generally may be said to be turned toward Lancaster county, the scene of the experiment. While the growing of Sumatra tobacco in this country is beyond the experimental stage, as yet the centre of this new enterprise, strictly speaking, is Connecticut, and the recent report to Secretary Wilson of last year's crop in that state has awakened interest. The tobacco raised under the supervision of experts from the Department of Agriculture has been sold at an averege price of \$1·25 a pound, and, as the cost was about 25 cents a pound, the profit was \$1 a pound. As the average farmer can raise 1,000 pounds of selected leaf to the acre, the growers all over the state are watching the local experiment. Connecticut will produce this year about \$1,500,000 worth of Sumatra leaf, which is about one-fifth of the annual importation of this particular tobacco. Under cover, the leaf has been known to grow to the height of eight feet. It is believed that the soil on the Pennsylvania tract is as good as, if not better suited, for Sumatra growing than, the Connecticut soil.—*Bradstreet's*, May 31.

CACAO AND RUBBER PLANTING.

Samoa.—The Samoa Estates, Ltd., has just commenced operations in cacao planting, and great things are expected from it, which bid fair to be realised. Mr Hart, F.L.S., of Trinidad, recommends in his work on cacao the planting of *hevea* rubber trees between the rows as shade plants. Some of the experienced planters here do not favour this, on the ground that the *hevea* rubber tree is not profitable to cultivate, and say that the *castilloa elastica* is better; they also think that the rubber tree should not be planted amongst the cacao. However this may be, it may be regarded as certain that large planting companies should cultivate the *castilloa elastica* rubber tree which, I am informed, thrives here equally as well as cacao, and yields a return in from six to eight years, some say. It is not as subject to disease as the cacao, and could be planted, as experts may recomend, either between the cacao rows or in another part of the plantation. Whether it withstands hurricanes better than cacao, which is a very fragile tree, I cannot say. I strongly advise the companies who intend to carry on planting operations here not to depend solely on cacao, but to plant as well indiarubber trees, with other tropical products suited to the soil. Kola, too, bearing in ten years, should be cultivated by small planters.—*British Acting Consul in Samoa.—British Trade Journal*, June 1.

TOBACCO-GROWING IN SOUTH AFRICA.

The modern smoker has such a wide range of tobacco from which to choose that the final selection of the brand which shall satisfy all his requirements is a matter of no little difficulty. Acting on the advice of various friends, he flits from one species to another, and finds, that so far as tobacco is concerned, there is no wisdom in the multitude of counsellors. Yet, even with the keen competition from oversea, South African—and especially Transvaal—tobaccos have hitherto held their own in public favour. And, now (says the "Cape Times") a new Cape rival has entered the field, and Transvaal growers will have to look to their laurels. It is about three years since Mr C W Leach, who had had wide experience as a tobacco-grower in the Rustenburg district of the Transvaal, first turned his attention to the Queenstown district as a favourable country for tobacco cultivation. He purchased the fine old farm in that district known as Poplar Grove, and there devoted himself to the cultivation of the "weed" on the most modern and scientific principles. The success of his operations has already been proved by the popularity of his tobaccos in the Eastern Province, but hitherto they have not been introduced to any extent in the Western districts, being only known to a fortunate few. Mr A Dowling, who represents Mr Leach, is now in Capetown with a view to introducing the Poplar Grove tobaccos in this city. The farm is now under cultivation to the extent of about 400 acres, on which at present about a million plants are grown. Estimating that each plant produces 3 lb. of tobacco yearly, the output works out at something over 3,000,000 lb. per annum. The consumption of Mr Leach's tobaccos already equals the supply, while the demand is far in excess, and consequently a large extension of the cultivated area is in progress, it being intended to cultivate no less than 3,000,000 plants during the present season.—*Natal Mercury*, May 27.

FRESH-WATER SHELL PEARL-BUTTONS.

During the last eight years the fresh-water shell pearl-button industry has developed in a greater degree than any other branch of button manufacturing. The fresh-water shell pearl-button industry did not exist in 1890, but since then vast quantities of mussel shells, formerly deemed valueless, have been taken from the Mississipi river and made the source of a revenue to the people of the states of Iowa and Illinois. In 1891 this country imported $100,000 worth of pearl or shell buttons. This sum was added to in 1892, when imports were valued at $292,332, but the next year, 1893, brought a slight decline, the values for imports for that year amounting to $275,216. In 1894 there was a remarkable falling-off in taking from oversea, the imports being valued at only $33,284. But in 1895 the loss of the previous year was entirely regained, imports being worth $375,886, the largest figures reached during the decade 1891-1900. From 1895 down to 1900 the value of such imports steadily dwindled, until in the latter year they amounted to only $36,262. In 1900 the output of fresh-water shell pearl-buttons amounted to 4,308.584 gross, valued at $1,176,285, and the production of ocean pearl-buttons was 4,049,452 gross, valued at $1,951,558; the respective items representing 20·3 per cent and 19 per cent of the entire button output of the country, which in 1900 amounted to 21,254,018 gross, valued at $6,467,373. The average price per gross received in 1900 for fresh-water pearl-buttons was 27 cents, as against 48 cents for ocean pearls. Photo and celluloid buttons brought in 1900 an average of 74 cents a gross, while bone and vegetable ivory buttons fetched 46 cents and 43 cents the gross respectively. Here it should be noted that United States Consul-General Jussen, in a report dated December 30, 1887, remarked "the manufacture of pearl buttons is not an industry of the United States and probably never will be." But on April 29th, 1898, Consul-General Hurst, writing apropos of the same subject (our imports of Austrian-made pearl buttons), noted that "the pearl-button industry of Austria-Hungary, which in former years occupied a prominent place among the flourishing industries of the monarchy, has dwindled of late to such an insignificant figure that pearl buttons can no longer be regarded as one of the principal articles of export to the United States. This may be attributed to the development of the industry in the United States." Nevertheless, by 1900 the making of these buttons constituted the second most important branch of the general indusry. To Mr J F Boepple, of Muscatine, Iowa, belongs the credit of having started the industry in the United States, which he did in 1891. A few years ago mussel shells were delivered at the factsories in Iowa and Illinois at about fifty to sixty cents per one hundred pound, but by February, 1898, prices averaged $18 to $20 the ton. In July of the same year, however, they were selling at thirty cents per one hundred pounds. The cheapest grade of ocean shells are the Panama, which sell at ten and half cents per pound.—*Bradstreets'*.

INDIAN GREEN TEA PRICES.

The sale of Indian Green Tea at last Friday's auction deserves special mention. Some 67 chests of uncoloured green tea made on the Drummond Deane process at Manabarie Estate, Dooars, were put up and sold at the following very decent prices: No. 1 or young hyson, 11 chests, 6-3. do, 11 chests. 6-4. No. 2 or hyson No. 1, chests, 5-3. No. 3 or hyson No. 2, 21 chests, 4-6. The above prices for green tea at last Calcutta sale compare very well with the prices realized for the majority of invoices of black teas offering at the same sale, and we are informed that there is no special difficulty for gardens now producing black teas of ordinary description, which now sell very low owing to the glutted market for such, to make green tea which will sell at better rates than those procurable for common blacks on the depressed market. Most leaf will make decent green tea; there is no fermentation in the process to give different classes of leaf a chance to develop in different ways.—*Indian Gardening & Planting*, July 3.

PLANTING NOTES.

THE RUBBER EXPLOITING COMPANIES.—The work of organisation of the Congo and Sangha Development Co., mentioned in the last *India Rubber World* as having been incorporated in New Jersey to acquire the concession of the Société de la Sangha Equatoriale, in the French Congo, has been in progress during the past month, but as yet no further details have become available for publication. Meanwhile, the promoters of the company have been in receipt of samples of rubber produced by the *concessionaire* company in Africa, which are regarded as the most attractive rubber from that continent ever seen in New York.—*India Rubber World*, June 1.

COMPTOIR COLONIAL FRANCAIS BANKRUPT.—The Comptoir Colonial Francais was adjudged bankrupt by the tribunal de commerce de la Seine, Paris, in a decree dated April 7, 1902 This is a joint stock company constituted in Paris in May, 1899, with 9,000,000 francs capital, for objects of colonisation and commerce, and particularly the exploitation of Caoutchouc. With headquarters in Paris, at rue des Petittes Ecuries, 54, the company conducted trading operations at Para and Manaos, Brazil; stations on both sides of the Rio Javy, in Brazil and Peru; at Conakry (French Guinea), and St. Louis (Senegal), West Africa.—*India Rubber World*, June 1.

MOSQUITO-HUNTING—has had marvellous effects in Cuba. Yellow fever and malaria are disappearing, and the "Pearl of the Antilles" is now fit for for an Anglo Saxon population. In October, 1900, there were 74 deaths and no cases. Dr Grogas of the United States Army, writes:—"The disappearance of yellow fever is, I think, almost altogether due to the killing of the infected mosquitoes at the infected point. We do this by burning pyrethrum powder in the infected house and all the neighbouring houses. It has been extremely gratifying to see how promptly the focus of infection is stamped out in this way." Sanitation is being carried out energetically in Cuba all round, and in a few years the invasion of the American army into Cuba will have saved more lives than it cost."—*Australian paper*.

TEA AND OUR GUESTS.—We are heartily glad to learn that the suggestion made by the *Ceylon Observer* (June 24th) that a present of tea should be made to each of the Boer prisoners has been taken up by the Ceylon Planters' Association and that that body had, through Messrs. Crosfield, Lampard & Co., presented a 5-lb. box of tea to each of those who sailed by the ss. "Templemore" early this week. As the subject is one which is to be discussed by the "Thirty Committee" in a few days we hope to see the step imitated in every case where the prisoners return direct to South Africa—though as yet the firm who acted in this case have had no further instructions. The writer of the following lament will, or one, be gratified:—

"Sad to read how the first lot of Boers—and the loyalest—got away; and a good advertisement of tea lost. Can nothing be done even now? I shall gladly give my mite, either in kind or in cash to a Fund."

TO THE PLANTING WORLD.

Seeds & Plants of Commercial Products.

Hevea Brasiliensis.—Orders being booked for the coming crop August-September delivery 1902, booking necessary before the end of April, quantities of 100,000 and over at special low rates. Plants available all the year round, 100,000 and over at special low rates. A leading Rubber planter in Sumatra, who purchased 50,000 seeds in 1899, and 100,000 in 1900, writes us, under date 15th November, 1900 :—"I received your letter of 20th October, from which I learn that you added another case of 5,000 seeds to replace the loss, &c. I am satisfied hereby, and even after this adding I am satisfied by the whole delivery of this year." Special offer, post free on application.

Castilloa Elastica.—True superior variety cultivated in Mexico, seeds from specially reserved old untapped trees. Orders booked for August-September delivery 1902, immediate booking necessary; large quantities on special terms; Plants in Wardian cases.

A foreign firm of Planters writes under date 11th October, 1901 :—"We beg to enquire whether you would procure us 100,000 Castilloa seeds, in which month we might expect them, and what would be the average price." Special offer, post free on application.

Manihot Glaziovii.—Seeds and Plants available all the year round, 100,000 and over at special low rates. A Mexican planter in sending an order for this seed wrote on the 22nd August, 1900 :—"If they arrive fresh and germinate easily I may send you larger orders, as they are for high ground where the Castilloa does not thrive."

Ficus Elastica.—Seeds available in May-June; booking necessary before the end of March; also plants.

***Mimusops* Globosa** (Balata) wood of the tree is much sought for buildings, fruits sweet like a plum and eaten, oil from seeds, said to yield as much as 45 lbs. of dry rubber per tree per annum, the milk is drunk and when diluted with water used as cow's milk, grow from sea-level up to 2,000 feet, orders being booked for seeds and plants, price on application.

Cinnamomum Zeylanicum (Cinnamon superior variety).—New crop of seed in April to June; booking necessary before the end of February; also plants.

Coffee Arabica, Liberian Hybrid and ***Maragogopie* Hybrid.**—New crop March-April; immediate booking necessary.

A foreign Agricultural Department writes dating 9th September, 1901 :—"Please accept our order for 175 lbs. of Tea seed and for 2,000 Coffee beans. In regard to Coffee seed I would say that this will be the first importation made by this department, and we will leave the selection of the varieties to be sent to your judgment."

OUR DESCRIPTIVE PRICE LISTS.

The following six Descriptive Price Lists are now being forwarded with Circulars and special offer of Seeds and Plants of Rubber and other Economic Products :—

1. Tropical Seeds and Plants of Commercial Products, enlarged edition for 1902.
2. Seeds and Plants of Shade, Timber, Wind-Belts, Fuel, and Ornamental Trees, Trees for Roadsides, Parks, Open Spaces, Pasture Lands, Avenues, Hedges, and for planting among crops (Tea, Coffee Cacao, Cardamoms, &c.)
3. Seeds and Plants of Tropical Fruit Trees including Mango grafts.
4. Bulbs, Tubers and Yams.
5. Orchids—Ceylon and Indian.
6. Seeds and Plants of Palms, Calamus, Pandanus, Cycads, Tree and other Ferns, Crotons, Roses, Dracinas, Shrubs and Creepers.

Special Arrangements made with foreign Governments, Botanical and Agricultural Departments, Planters and others for supplying seeds and plants of Commercial Products in large quantities.

"South Africa."—The great authority on South African affairs of 25th March, 1899, says :—"An interesting Catalogue reaches us from the East. It is issued by William Brothers, Tropical Seed Merchants of Henaratgoda, Ceylon, and schedules all the useful and beautiful plants which will thrive in tropical and semi-tropical regions. We fancy Messrs. Williams should do good business, for now that the great Powers have grabbed all the waste places of the earth, they must turn to and prove that they were worth the grabbling. We recommend the great Powers and Concessionaries under them to go to William Brothers."

Agents in London :—Messrs. P. W. WOOLLEY & Co., 90, Lower Thames Street.

Agent in Colombo, Ceylon :—E. B. CREASY, Esq.

Agent in British Central Africa :—T. H. LLOYD, Esq., Blantyre.

Telegraphic Address :
William, Henaratgoda, Ceylon.
Liber's, A.I. and A.B.C. Codes used.

J. P WILLIAM & BROTHERS,
Tropical Seed Merchants,
Henaratgoda, Ceylon.

TEA SALES AND AVERAGES.

We direct attention to the letter of "A Planter" on this subject and especially the attention of the Brokers both here and in London. We fear the labour involved in working out the fuller information desired by our correspondent would be deemed prohibitory of the adoption of the plan. As matters stand, the detailed lists of each sale are open to each reader, showing how many grades are included, and of course no merchant, agent, proprietor, or practical planter is deceived by the high averages reported when only the highest grades have been offered for sale. At the same time no doubt the impression left on the mind of the ordinary reader is an unfair one, by the selection in our local paragraphs, or on the front page of London circulars, of the estates securing the highest averages without specifying the grades included in each case. So far as we are concerned, we must in future confine ourselves to the highest prices obtained for the same grade —thus the highest price for Orange Pekoe at yesterday's sale was 54 cts. for St. John's estate; for Broken Orange Pekoe, Devonford, 78; and for Broken Pekoe, Poonagalla, 56; and so on through all the grades. In this we suppose there will be much less unfairness, although even then comparisons can never be quite equitable; because an estate may pay special attention to a very few grades; while another Manager is bound by orders to do justice to all grades. In fact, only a rough approximation to fairness (by way of comparison) can be attained in any system of quoting prices or averages for our tea sales.

THE PROSPECTS OF "INDIA RUBBER."

Very full and interesting is the information which we this month receive from America, regarding the enormous Rubber industry and its several developments along the great Amazon river and its many affluents through Brazilian, Bolivian and Peruvian territory. We must quote in full in our *Tropical Agriculturist* some very interesting reports as to the different modes of treating forests of *Hevea* (Para) and of *Castilloa Elastica* respectively. But, in the meantime, we may mention that in the back valleys of Peru—near the region reported on by Messrs. A. Sinclair, the late Alex. Ross and P. D. G. Clark—the latter tree is said to grow profusely and "it is invariably cut down as it yields milk from the whole of the trunk; while the *Hevea* is only tapped, as it only yields juice from between the bark and stem." Again here is an astonishing statement in the same report:—"although entire forests of C. Elastica (Caucho) have been destroyed, the ground is quickly covered again with the trees from the roots or seeds left in the soil and in six years are fit to be again felled, so rapid is the growth." This fact—if fact it be—coupled with the accounts of the vast Rubber-growing regions still to be exploited, is not very encouraging to Eastern planters of rubber. On the other hand a botanical authority has pronounced that there are at least three kinds of *Castilloa* and that one of them is valueless, so that grave doubts are expressed if all the *Castilloa* plantations formed in Mexico will prove productive. It is generally considered that *Hevea* is the safer tree to cultivate. Here is another kind of warning from Mexico:—

James Maunder writes from San Juan Evangelista, Vera Cruz, to *The India Rubber Journal* (London): "I know of the disasters which befell some of our people who purchased a going concern —rubber—in this country; there is another concern going to be offered in London pretty soon, but take *Punch's* advice, 'Don't.' There is good wild land here to be had, near rail and river, for from 21 shillings per acre, and lots of money to be made, but the manager should be a man of experience in tropical agriculture."

The very extensive Acre (Rubber) concession granted by Bolivia to an Anglo-American Syndicate is likely to cause trouble with Brazil which is preparing to prevent access to the territory, if necessary, by force.

Finally, we draw the special attention of out Rubber planters to the article we reproduce on our sixth page from the *India Rubber World* of New York, as affording practical information on the difference between Para rubber produced in the Straits Settlements and that got from Brazil. In the editorial remarks, however, we fail to find discouragement to rubber planters, whether in Perak or Ceylon—quite the contrary. We do not think that London Brokers would give so good a price for the "cleanly-prepared" Para rubber from the East unless they were well assured of its appreciation by manufacturers.

TEA AND COFFEE IN INDIA IN 1901-2.

An elaborate review of the Trade of India for 1901-2 by Mr. J. E. O'Conor, C.I.E., Director-General of Statistics to the Government of India, has just come to hand, and we may at once quote the remarks made on our staple. First, as to its importation to the value of R1,603,936 in 1901-2, we are told:—

The importations of Tea declined to about the level of 1899-1900, the fall indicating a diminished use of Bombay as a depot for the shipment of teas to the regions served from the Persian Gulf and Afghanistan. Moreover, the prices of tea in the Indian market ranged on too low a level last year to offer an inducement for importation on an extensive scale for local consumption. The operations at present in hand for extending the consumption of Indian tea in India should have some effect presently on the importations of China tea.

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TEA SALES AND AVERAGES.

WE direct attention to the letter of "A Planter" on this subject and especially the attention of the Brokers both here and in London. We fear the labour involved in working out the fuller information desired by our correspondent would be deemed prohibitory of the adoption of the plan. As matters stand, the detailed lists of each sale are open to each reader, showing how many grades are included, and of course no merchant, agent, proprietor, or practical planter is deceived by the high averages reported when only the highest grades have been offered for sale. At the same time no doubt the impression left on the mind of the ordinary reader is an unfair one, by the selection in our local paragraphs, or on the front page of London circulars, of the estates securing the highest averages without specifying the grades included in each case. So far as we are concerned, we must in future confine ourselves to the highest prices obtained for the same grade—thus the highest price for Orange Pekoe at yesterday's sale was 54 cts. for St. John's estate; for Broken Orange Pekoe, Devonford, 78; and for Broken Pekoe, Poonagalla, 56; and so on through all the grades. In this we suppose there will be much less unfairness, although even then comparisons can never be quite equitable; because an estate may pay special attention to a very few grades; while another Manager is bound by orders to do justice to all grades. In fact, only a rough approximation to fairness (by way of comparison) can be attained in any system of quoting prices or averages for our tea sales.

THE PROSPECTS OF "INDIA RUBBER."

Very full and interesting is the information which we this month receive from America, regarding the enormous Rubber industry and its several developments along the great Amazon river and its many affluents through Brazilian, Bolivian and Peruvian territory. We must quote in full in our *Tropical Agriculturist* some very interesting reports as to the different modes of treating forests of *Hevea* (Para) and of *Castilloa Elastica* respectively. But, in the meantime, we may mention that in the back valleys of Peru—near the region reported on by Messrs. A. Sinclair, the late Alex. Ross and P. D. G. Clark—the latter tree is said to grow profusely and "it is invariably cut down as it yields milk from the whole of the trunk; while the *Hevea* is only tapped, as it only yields juice from between the bark and stem." Again here is an astonishing statement in the same report:—"although entire forests of C. Elastica (Caucho) have been destroyed, the ground is quickly covered again with the trees from the roots or seeds left in the soil and in six years are fit to be again felled, so rapid is the growth." This fact—if fact it be—coupled with the accounts of the vast Rubber-growing regions still to be exploited, is not very encouraging to Eastern planters of rubber. On the other hand a botanical authority has pronounced that there are at least three kinds of *Castilloa* and that one of them is valueless, so that grave doubts are expressed if all the *Castilloa* plantations formed in Mexico will prove productive. It is generally considered that *Hevea* is the safer tree to cultivate. Here is another kind of warning from Mexico:—

James Maunder writes from San Juan Evangelista, Vera Cruz, to *The India Rubber Journal* (London): "I know of the disasters which befell some of our people who purchased a going concern—rubber—in this country; there is another concern going to be offered in London pretty soon, but take *Punch's* advice, 'Don't.' There is good wild land here to be had, near rail and river, for from 21 shillings per acre, and lots of money to be made, but the manager should be a man of experience in tropical agriculture."

The very extensive Acre (Rubber) concession granted by Bolivia to an Anglo-American Syndicate is likely to cause trouble with Brazil which is preparing to prevent access to the territory, if necessary, by force.

Finally, we draw the special attention of out Rubber planters to the article we reproduce on our sixth page from the *India Rubber World* of New York, as affording practical information on the difference between Para rubber produced in the Straits Settlements and that got from Brazil. In the editorial remarks, however, we fail to find discouragement to rubber planters, whether in Perak or Ceylon—quite the contrary. We do not think that London Brokers would give so good a price for the "cleanly-prepared" Para rubber from the East unless they were well assured of its appreciation by manufacturers.

TEA AND COFFEE IN INDIA IN 1901-2.

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Finally, we quote what is said about our old staple, though of no account in our Ceylon trade now :—

Coffee.—The exports have been :

		cwt.	R
1898-99	...	270,056	1,74,98,242
1899-1900	...	281,353	1,48,47,146
1900-01	..	246,431	1,22,84,498
1901-02	..	255,042	1,25,02,290

There was a small recovery in the exports, but the quantity was still much below the level of former years, and it cannot be said that the trade is progressive. The quality of Indian coffee is good, so good that it is appreciated by Arabs and Turks, but the world's markets are dominated by the great abundance of the supply of the cheaper kinds from Brazil which gives three-fourths of the production of the world, and last year's exports from that country were so excessive that prices fell to a lower point than ever. Indian coffee remains depressed in price even when the available supply is restricted either by an unfavourable season or by the ravages of disease. It is difficult, however, to ascertain with accuracy the area, yield, or condition, of the coffee estates of Southern India, the planters being averse, for some unstated and unconjecturable reason, to communicate statistical information relating to the industry. The menace of differential treatment of Indian coffee in France (to which a full third of it is exported) by applying to it the duties leviable under the general tariff while Brazilian coffee is charged at special minimum rates, has not yet taken effect. The *modus vivendi* under which the minimum tariff is provisionally applied to Indian coffee has been prolonged from time to time and will continue for a few months longer.

"IS TEA INTOXICATING. ?"

A NEW ZEALAND EXPERT AND THE "CEYLON OBSERVER.

Mr A H S Lucas, tea expert, referring to our published quotation from the *Ceylon Observer* under the heading, "Is Tea Intoxicating?" writes:—As this query affects the whole community, tea being a national beverage, I should like you to give a few facts that have come under my notice during the last fifteen years' experience as one of a number of tea-tasters. Dr D H Lord states that more poison can be obtained from an equal quantity of tea than from beer, and yet, after perhaps some hundred years of continuous tea-drinking, the nations of the earth do not trace any bad effects to its use. Marvellous, but true, and one would think that the house on the corner had the doctor's full sympathy ; not but that alcohol has its full merits, when used with discretion. I might say that most nations have their harmless national beverage, and, without fear of contradiction, I state that tea is the one most used. For instance, the Chinese and Russians drink China tea ; the Britishers, colonials and Americans consume Ceylon and Indian teas ; the Japanese take Java and China teas ; in Mauritius they make tea from the leaves of an orchid ; in Peru they drink Mate, a tea made of a species of holly ; the Abyssians make a tea with the leaves of "Catha ednlis," which has strong stimulating properties; last, but not least, the Fijians are now growing their own teas, the plants being imported from India and Ceylon. At an average of fifty cups tasted daily, 39,125 grains of theine are swallowed annually by tea experts—a quantity sufficient to kill 7,825 rabbits.—*New Zealand Mail*, June 11.

TEA CULTIVATION IN INDIA :—

ABANDONMENTS *vs.* EXTENSIONS.

THE EXPERIENCE OF THE PREMIER INDIAN TEA COMPANY.

From the London *Times* of June 17th we take the following interesting report of the proceedings at the annual meeting of the Assam Company. The Chairman's speech is worth noting as typical of the feeling prevalent among the Directors of large Indian Companies. It will be seen that "extensions" were called for, "abandonments" hinted at, and plans for discontinuance of plucking or destroying crop—over which so much time and talent have been wasted —were scouted :—

The annual general meeting was held yesterday, June 16th, at the offices, Laurence Pountney-hill. Mr. J Graham, K.C., presided, and, in moving the adoption of the report, said that the directors were very glad to be able to present a more favourable statement than that which they submitted a year ago. Owing to the great fall in the value of tea, and to the difficulties in the way of the trade, the result of the company's working in the previous year was that there was nothing to divide, but for the year under review they were able to pay a dividend of 7½ per cent., which, he thought, would be considered satisfactory in the present condition of the tea trade. He hoped in another year that they might do better, but at present the trade was in a transitive state. In the opinion of some it was just about reaching the lowest point, but others thought that an amendment was taking place. The tea produced in the past season had been excellent, but prices remained very low indeed, and there did not seem any immediate prospect of an advance. This was owing to the immense over-production in the past, and at the present time stocks were very large. Probably the area of cultivation would be decreased. In the past year 10,000,000 lb. of tea less were produced. Many persons had thought that it would be a panacea for all the ills of the trade if the production of Ceylon and Indian teas could be reduced by 10,000,000 lb., but although that had been done, there did not appear to be any material market improvement. There was, however, no saying how much reduction might go on in the future owing to low prices, and the smaller the quantity of tea produced the greater the chance for those who had it to sell. In the past year the company produced about 3,500,000lb or 900,000 lb. less than in the previous year, when, however, the tea was of very poor quality indeed. The actual price obtained by them for their tea last year was about 8d a pound only, whereas in the year under review they obtained within a fraction of 2d a pound more. This improvement and the great reduction which had been effected in the expenses in India had resulted in their making a net profit of about £16,000. The decrease in the expenses had been very large—about R2,25,000, or about £14,000, and the saving had been effected without in any way impairing the efficiency of the work, which had gone on as well as ever. Their estimated production for the

current year was about 4,000,000 lb.* and the directors hoped that prices would certainly not go down. At present, however, all these estimates were uncertain, and the shareholders must take them for what they were worth. All the indications pointed to a more favourable state of things than had lately prevailed. Mr. Albert B Fisher (deputy chairman) seconded the motion. Mr. Fergusson congratulated the directors on the improved results shown in the past year. Mr. Reed stated that, judging from the returns, some of the company's gardens must have been working at a dead loss, although it was gratifying to see the satisfactory working of the Towkok garden. In view of the condition of the old gardens he strongly advised the necessity of extensions. Mr. McMichen thought that the cost of working each garden might be given; and he drew attention to certain expenses which he thought might be reduced. Mr. Seton also thought there was room for further economies. He advocated the abandonment of unremunerative areas of cultivation or reducing the expenditure on them to the lowest possible limit. Mr. Bullock stated there was a proposal on foot to meet the great overproduction by stopping plucking from the end of July for three weeks, and he desired to know if the company intended to join in this movement. The chairman, in reply, stated that they were not willing to agree to the measure referred to by Mr. Bullock; it would not suit the company to do so at present. The position would be different if the factors in all cases were the same, but the directors' view was that all these combinations fell through. With reference to the amount of the medical charges, there were about 14,000 coolies,* besides children, to look after. Nearly all the vacancies in the different gardens had been filled up. The company had about 20 gardens, only two of which did not pay their expenses last year, although the deficiency in both cases was very small—£350 and £29. Several portions of gardens which were not remunerative had been abandoned; and for the last 15 or 20 years, indeed, the course had been followed of shutting old gardens and opening new ones. The motion was adopted.

PARA AND RAMBONG RUBBER IN THE STRAITS.

VISITED BY CEYLON PLANTERS.

In commenting on the annual report of the Negri Sembilan Planters' Association for 1901, just issued, the *Straits Times* says:—"Para-Rubber appears likely to be the salvation of the coffee planter. On most estates it will be found planted through the coffee to which it appears to do very little damage. Recently two well-known Ceylon planters, who are largely interested in Para cultivation in that island, visited the State. They seemed to be very pleased with the prospects of Para there and fancied that the trees there, when compared with those of a like age in Ceylon, showed freer growth. At present, so far as is known, the rubber is of a superior quality, but tapping appears difficult in the case of young trees. The report urges that Government should, with advantage to itself, advertise at home, say, the grant of free blocks of land for this cultivation with a view to attracting new blood and capital into the State."

* The Company must have about 11,000 acres in bearing, thus giving about 360 lb average per acre and about 1⅓rd cooly per acre.—Ed. *T.A.*

PROPOSAL TO PROHIBIT THE SALE OF TEA DUST.

The tea industry is in a very critical position. If the season is favourable for growth it probably means bad times for several concerns; if the season turns out to be a bad one for yield, we shall no doubt exist another year, but we have the same "bugbear," over-production, staring us in the face at the end of it. The idea of not plucking from 1st August to 21st August will not commend itself to any planter. Moreover, I hardly think it would be carried out. No doubt if it were loyally done, it would be an excellent thing.

I beg to make a suggestion. The scheme is to prohibit the sale of tea dust, say, for three years. Assuming four per cent of dust is made it would reduce the total crop quite eight per cent, because 1 lb. of dust makes about 120 cups of tea, whereas 1 lb. of pekoe souchong makes about 60 cups.

A great deal of dust is brought by natives in the bazaars, and if they could not get it they would buy twice the weight of pekoe souchong or other cheap teas.

The dust need not be thrown away; it could be sold at nearly an anna per lb. for making Caffeine, etc., and packed in bags or other old boxes without lead.

It costs quite one rupee and four annas per maund to pack dust in leaded chests. This would be saved so that the loss to producers would roughly be, say:—

	Rs. As. P.	Rs. As. P.
1 maund of dust worth		12 8 0
Less packing charges saved ...	1 4 0	
Less received for dust sold as tea waste	4 0 0	5 4 0
Nett loss		Rs. 7 4 0

per maund of crop or a little less than 1½ anna per lb.

In any scheme for abandoning acreage, not pruning or not plucking certain areas, or throwing away a percentage of crop, a garden would lose income on so much crop, at the average price realised for the remainder of the crop.

Say for instance it was determined to temporarily abandon eight per cent of the area of yielding tea. Take the case of a 1,000-acre garden making seven maunds per acre and getting a five-annas average.

	Rs. As. P.
A garden making seven maunds per acre and an average of five annas per lb. would abandon 80 acres at seven maunds equals 560 maunds tea at five annas per lb. and lose an income of ...	14,000 0 0
By the scheme I suggest eight per cent of the reduction would equal 280 maunds dust, *i.e.*, four per cent on a crop of 7,000 maunds at a loss of 1½ anna per lb. ...	2,100 0 0
Amount of income saved	Rs. 11,900 0 0

Although the quantity of the crop is practically reduced by the same amount of tea.

In America if teas contain dust the customs won't pass them I believe. Perhaps our customs might do the same for us; that is, if the Agents and Tea Brokers could not prevent dust being mixed in and sold.—*Englishman* (*Cor.*), June 30.

THE NEW "PARA RUBBER" FROM THE EAST: CEYLON'S HIGH PRICES.

At a recent auction sale in London six cases of fine rubber from Ceylon, the product of cultivated trees from Para seed, brought 3s 4½d, or about 81·4 cents, whereas the highest price for real Para rubber reported during the week was only 3s 0½d per

pound. This is not the first instance of exceptionally high prices obtained in the London market for "Para rubber" from plantations in the East. The declining profits of coffee growing have forced the planters in that part of the world to seek some more remunerative planting, and already thousands of acres are covered with rubber trees under cultivation. Not unnaturally attention has been turned chiefly to Para rubber, on account of the universally higher price which it commands, and now that the first trees planted are becoming productive the result of the sale of every little lot exported seems to the planters to confirm their choice. There is no computing how much planting of Para rubber since 1900 has been due to the sale of 327 pounds, sent from Perak to London in that year, at 3s 10d.

It is not impossible that these planters may yet be disappointed, for the reason that it remains to be seen whether what they are producing is reallly "Para rubber." The tendency in nature is for all species to be influenced by a change of habitat. It appears, for example, that trees of the genus *Hevea* —the source of Para rubber—when grown in the East, become productive at an earlier age than in the Amazon valley; again, it is stated that, while in the Amazon forests the seed pods of the *Hevea* uniformly contain three seeds, the number is irregular on the trees in the Malay States, and there are other indications of a tendency to "sport." It is possible that, under cultivation, the tree might in time develop different characteristics even in Brazil, where thus far it has existed only under natnral forest conditions. Ultimately new species of *Hevea* may exist, as a result of change of soil and climate, and of transfer from forests to plantations.

We have already expressed our opinion of samples of the cultivated rubber from the Malay States, which, while attractive in appearance, do not really resemble the fine Para rubber now in use. It is much softer than the Brazilian product, and of much shorter "fibre." It could not be used, for example, in thread, elastic bands, or any fine pure gum goods. In solution it quickly loses its tenacity, so that it would not do for high grade cements. And it readily softens with age. Perhaps some of these defects might be removed by the introduction in the East of the methods of coagulation employed in the Amazon rubber camps, but we are disposed to believe that the Eastern planters have really produced a new grade of rubber, and that the Para article can never be wholly duplicated by them. It is to be understood, of course, that the rubber is valuable and will find a ready market at a price which is likely to yield a profit, but such samples as have reached us, valued from the manufacturer's standpoint, would rank at least 25 per cent below fine Para.

The good prices realised in London, doubtless, have been due to the cleanly appearance of the new rubber; and they have been based on the judgment of brokers, rather than results of practical tests in the factory. It would seem that the better course for the planters' associations would be, not to try to find how much money can be obtained in the open markets for their sample lots—which then become lost to sight—but to send them direct to a well-equipped factory, to be made up in various forms of goods. The manufacturers' test is the one by which the value of this rubber will be judged finally, regardless of what may be the judgment of brokers today. We do not mean to damp the enthusiasm of the planters, but there is such a thing as basing their plans upon estimates of profits that are impossible.—*India Rubber World*, June 1.

INDIAN TEA PATENTS.

Specification in respect of the undermentioned invention has been filed, under the provisions of the Inventions and Designs Act of 1888, in the office of the Secretary appointed under that Act:—No 179 of 1901.—Frank Edmund Winsland and George Ernest Moore, Engineers, both of Joyhing tea estate, North Lakhimpur, Upper Assam, India. Improvements in apparatus suitable for packing tea. (Specification filed 30th November 1901.)

Application in respect of the undermentioned invention has been filed, under the provisions of the Inventions and Designs Act of 1888, in the office of the Secretary appointed under that Act:—No. 20 of 1902.—William Martin Glynn, tea planter, at present residing at the Adelphi hotel, Calcutta, British India. A new or improved process for equalising tea leaf, and apparatus therefor. —*Indian Engineering*, June 28.

INDIAN TEA ASSOCIATION.

THE RESTRICTION AND EXPANSION RESOLUTION.

Calcutta, July 1.—Read copy of Minutes of a Meeting of the Advisory Committee of the Indian Tea Markets Expansion Commission held on 24th June, forwarded for information by Messrs Andrew Yule & Co. At this meeting the follow- Resolution had been adopted:—

"That with reference to the recent suggestion from London that growers should stop manufacture of their crop from 1st to 21st August inclusive, so that the anticipated over-production may not cause a slump in prices this Committee after reading the report of the Indian Tea Markets Expansion Commission now before them, are more than ever convinced that the relief for the Industry in the matter of over-production can be found in India, and they strongly urge Proprietors, Managing Agents, and every one connected with the Tea Industry to contribute the Tea it is proposed to destroy to the Indian Tea Markets Expansion Commission, so that no portion of India need be left untapped in the matter of pushing sales of tea."

The Commissioner (Messrs Andrew Yule & Co.) had been requested to forward a copy of the Resolution to the General Committee of the Indian Tea Association and to urge that the matter should be laid before the Indian Tea Association, London, and also before the signatories to the suggested restriction scheme. Further consideration of the matter in a modified form was postponed until receipt of a reply from London as to the exact position in regard to the restriction scheme.

ADVERTISING IN AMERICA.

A short discussion then took place regarding the effect on the American trade of the stoppage of advertising of Indian Tea. From all accounts it appeared that while the demand for Indian Tea in the United States had fallen off in a marked degree, Ceylon teas which were advertised freely, were steadily increasing in favor. It was recognised that the whole question turned upon the want of funds to advertise freely and continuously. Spasmodic efforts for advertising on a small scale were of little avail, and matters, it seemed likely, would go from bad to worse unless ample funds were forthcoming to enable a vigorous campaign to be opened. Relief could only be looked for from the sanctioning by Govern-

ment of the Tea Cess Scheme, and, as the area supporting the proposal now amounted to about 80 per cent of the total acreage under tea, it was decided to again invite the attention of the Government of India to the memorial submitted in March last.—*I. T. A. Minutes.*

TEA EXPERIMENTS IN THE PHILIPPINES.

An experiment in tea culture is being made by Mr. T H Donaldson-Sim at Benguet in the Philippines.—*Overland China Mail*, June 30.

CEYLON PATENT.

A list of fourteen patents is given in the *Gazette* as having been granted under the Inventions Ordinance during the half-year ended 30th June last. Of these no less than six are of immediate interest to us in Ceylon, and they have been granted to the following:—

698.—Montague Kelway Bamber, of the Laboratory, Hyde Park Corner, Colombo, Ceylon, Agricultural Chemist, and John Roger, of 6, Coningsby road, Finsbury Park, London.—An improved method of filtering and the separation of suspended solids from a fluid.—February 4th, 1902.

699.—Montague Kelway Bamber, of the Laboratory, Hyde Park Corner, Colombo, Ceylon, and John Roger, of 6, Coningsby Road, Finsbury Park, London.—Improvements in producing a pure and soluble extract of tea.—February 6th, 1902.

712.—James Begg, of Hoolungoorie Tea Estate, Assam, British India.—A New and Improved Machine for artificially withering tea leaf.—February 22nd, 1902.

286 of 1896.—Alfred Brown.—Invention for improvements in machinery for rolling tea leaf.—Extended for a further term of 14 years.—February 27th, 1902.

725.—Alfred Baur, of Colombo.—Disintegrating fish and other articles.—April 5th, 1902.

719.—John Thomas Mitchener, of 33 T, Juniper Street, Shadwell, London, England, and William Stanning Ross, of 10, Church Court, Wapping, London, England.—Improvements in chests for tea and other substances.—May 13th, 1902.

THE PINE-APPLE AS A DIGESTIVE AID.

The partaking of a slice of pine-apple after a meal is quite in accordance with physiological indications, since though it may not be generally known, fresh pine-apple juice contains a remarkably active digestive principle similar to pepsin. This principle has been termed "bromelin," and so powerful is its action upon proteids that it will digest as much as 1,000 times its weight within a few hours. Its digestive activity varies in accordance with the kind of proteid to which it is subjected. Fibrin disappears entirely after a time. With the coagulated albumin of eggs the digestive process is slow, while with the albumin of meat its action seems first to produce a pulpy gelatinous mass which, however, completely dissolves after a short time. When a slice of fresh pine-apple is placed upon a raw beef-steak the surface of the steak becomes gradually gelatinous owing to the digestive action of the enzyme of the juice. Of course it is well-known that digestive agents exist also in other fruits, but when it is considered that an average sized pine-apple will yield nearly two pints of juice it will be seen that the digestive action of the whole it must be enormous. The activity of this peculiar digestive agent is destroyed in the cooked pine-apple, but unless the pine-apple is preserved by eat there is no reason why the tinned fruit should not retain the digestive power. The active digestive principle may be obtained from the juice by dissolving a large quantity of common salt in it, when a precipitate is obtained possessing the remarkable digestive powers just described. Unlike pepsin, the digestive principle of the pine-apple will operate in an acid, neutral, or even alkaline medium, according to the kind of proteid to which it is presented. It may therefore be assumed that the pine-apple enzyme would not only aid the work of digestion in the stomach but would continue that action in the intestinal tract. Pine-apple, it may be added, contains much indigestible matter of the nature of woody fibre, but it is quite possible that the decidedly digestive properties of the juice compensate for this fact.—*Lancet.*

NEW CEYLON COMPANIES.

The following are registered in the *Investors' Guardian* of June 21:—

CEYLON AND INDIAN TEA CO., LTD., (74,001).—Registered June 10, with capital £5,000, in £1 shares (2,000 pref) to carry on the business of refreshment room proprietors, caterers and contractors, tea, coffee and cocoa dealers, bakers, confectioners, milk and butter sellers, dairymen, tobacconists, wine and spirit and beer merchants, ice merchants, etc. No initial public issue. Registered without articles of association by Dunn and Duncan, 87, Chancery Lane, W.C.

HENRY JENKINS, LTD., (74,043).—Registered June 13, with capital £10,000, in £5 shares, to acquire properties in Ceylon or elsewhere and any plant, machinery, stock in trade, book debts and other assessments connected therewith, to carry on the business of tea, sugar, cocoa, cinchona and coffee planters, manufacturers of and dealers in vegetable products, etc., and to adopt an agreement with Henry Jenkins. Minimum cash subscription £1,000. The number of directors is not to be less than 3 nor more than 5; the first are E G Hill, H Jenkins and W H Short; qualification £100; remuneration £100 per annum, dividend. Registered by Tilleards 10, Gracechurch St., E.C.

COCONUT PLANTATIONS IN THE MALAY STATES.

DEPREDATIONS BY RATS AND BEETLES.

In his annual report for the year 1901, on the Federated Malay States, just published, the Resident General, Mr. W H Trencher, C.M.G., says:—Coconut plantations are said to have a bright future and the yield of fruit from palms on the alluvial flats is very large. Rats are proving almost as damaging to coconuts as to padi, and I regret to say that the hopes held out in my last report that Dr. Hamilton Wright would be able to cope with the rat plague by a system of inoculation have not been fulfilled. Beetles, likewise, are most destructive to coconuts. The provisions of the existing "Coconut Trees Preservation Enactment" must be more energetically enforced and if necessary strengthened.

BROOKE, BOND, AND CO., LTD.

THE ANNUAL MEETING.

The ordinary general meeting was held at Winchester-house yesterday. Mr. Hector M. Forbes presided, and moved the adoption of the report and the payment of the dividend and bonus therein recommended. He observed that the company had existed for ten years, and during that time had earned a net profit of £344,476, distributed to the shareholders in dividends and bonuses £176,126, built up a reserve fund, including premium on new shares, of £140,000, wiped out £100,000 goodwill, accumulated a provident

fund of £2,500, established an insurance and contingency fund of £5,000, and written down machinery, fittings, &c., at 15 per cent. per annum. A considerable amount of the reserve fund was in gilt-edged securities. The output had grown immensely during the ten years, but the percentage of net profits had decreased. The grocery trade had not been in the most satisfactory position during the past year. Competition was severe and continuous, and it was only by rigid economy, prudence, and forethought that a cash business could prosper. Notwithstanding the depressed trade of the country and the keen competition, the board came before the shareholders with a record balance-sheet. They proposed to pay a dividend of 15 per cent. and a bonus of 2½ per cent. per annum, to transfer to the provident fund £500, to put £13,000 to reserve, to allocate £441 to insurance and contingency fund, and to carry forward £2,241. It was his wish, as the second largest shareholder, to persevere in increasing the reserve fund until it amounted to £150,000 (the total amount of the capital of the company), invested in gilt-edged securities. For the past three years the trade had been agitated by the problem of increased duty. He thought that the company's grocer customers might safely dismiss from their minds all fears that any Chancellor of the Exchequer would again increase the duty on tea, and the conviction of the board was that the present Chancellor or his successors would bring that duty down to 4d., the amount at which it stood before the first war Budget was introduced. Tea was a necessity of life to the great majority of the toiling millions of the British Empire, and the consumption per head was steadily growing. The Indian and Ceylon tea-growing industries were suffering from the increased taxation. It seemed unreasonable that tea should pay an impost of nearly £6,000,000 upon a value of £7,500,000. In Indian and Ceylon producing circles there were rumours of combinations and restricted output, but the board believed that these were doomed to failure. Mr. A. Richardson seconded the motion, which was adopted.—London *Times*, June 21.

PLANTING NOTES.

Queensland Sugar Plantation : Sold at £5 an Acre.—Brisbane, June 19.—The Fairleigh sugar plantation at Mackay has been sold to a syndicate, representing Maryborough and Bundaberg investors, at a price variously stated from £40,000 to £45,000. The estate comprises 9,000 acres. It has nearly twenty miles of tramways and a mill capable of making ten thousand tons of sugar per annum.—*Australian paper*.

The Great Western Tea Estate Company.—All concerned in the Great Western Tea Estate Company of Ceylon are to be congratulated on the rosy tale which Mr. J. C. Dunbar, the Chairman, was able to tell at the annual general meeting. A dividend of 11 per cent was declared, a result which in the present state of the industry must be considered remarkable. R74,283·75 were available for distribution. A sum of R6,833·70 was set aside for depreciation ; R7,500 was placed to reserve account and a balance of R2,543·75 and the remaining R64,240 is absorbed by the dividend. The Chairman's remarks make interesting, and to the shareholders in the Company, delectable reading.

Green Tea-makers — should note the account of the Drummond Deane process, given by "The Agent" and quoted in our daily and *T.A.*

Ceylon Trees and Flowering Plants.—We have to acknowledge receipt of a copy of a descriptive catalogue of the more useful trees and flowering plants of the Western and Sabaragamuwa Provinces by Mr. F Lewis, F.L.S., of the Forest Department. It has been reprinted, at the Government Printing Office, from the Asiatic Society's Journal.

A Collection of Dwarf Trees Imported from Japan—by Messrs Barr and Sons—is exhibited at the Royal Botanic Society's Gardens, Regent's-park. Several of them are of great age, a fine 'thuja obtusa' being stated to be a century old, and all have been carefully trained with that skill and patience which the Japanese bring to bear on this novel form of arboriculture. There was quite a forest of pigmy trees. These trees can be successfully kept in health, despite the vagaries of our climate, with very little trouble. —*L. and C. Express*, June 20.

Prickly Heat.—This, in some cases, is a troublesome affection during the hot season. The writer has found the following treatment effective, especially in the early stages. First, moisten the parts affected with water, then dust over with a small quantity of white oxide of zinc and rub gently with wet fingers until it forms a paste. This will soon dry and leave the appearance of a white wash. Repeat night and morning until the itching and red appearance have entirely disappeared. Sometimes the ointment of white oxide of zinc is used, but this is greasy and disagreeable. Where there is a general tendency to prickly heat, immediately after the morning bath dust over with powder composed of one-third parts of each of the following, viz: white oxide of zinc, boric or boracic acid in powder and starch powder well shaken together. —*Agricultural News*, June 7.

"Muir" Tea Company Reports.—The report of the Amalgamated Tea Estates Company, Ltd., for the year ending 30th November, which appears in our daily and *T. A.* is fairly satisfactory. The crop gathered from the Company's estates was some 180,917 lb. in excess of the previous year ; but the prices obtained fell ·63d per lb. This is attributed to the general "low range of values for Darjeeling tea in the London market." The Managing Agents and the London Agents have renounced the emoluments due to them which has somewhat relieved the revenue account. Dividend at the rate of 5 per cent per annum is paid on the first 6 months of the year ; but in the latter half they have had to content themselves with re-invigorating the Reserve account by £5,000 and carrying forward to next year £8,002 15s 3d. The Consolidated Tea and Lands Company, Ltd., whose report we published also had a considerable shortage of crop having plucked finer and secured a rise in their prices of ¼d per lb. Notwithstanding they were unable to pay a dividend, but placed £41,634 0s 7d to Reserve, and a sum of £2,055 9s 5d to the preliminary expenses account. The report, however, predicts good times to come.

Correspondence.

To the Editor.

CEYLON MEN IN SOUTH AFRICA:— LANTANA AND ITS PEST.

Heidelberg, Transvaal, May 31.

Dear Sir,—I have had the enclosed cutting in my pocket for many weeks, intending to send it to Ceylon (my old home). You will see that at the Cape they are very much afraid that the lantana "hedges" may be destroyed by the scale insect. Perhaps this same insect might be of some use to you in Ceylon.—The only thing is, will it enjoy the tea more than the lantana? Experiments might be made by some specialist:—

Growers of coleus plants and gardeners generally may recollect articles which appeared in the *Agricultural Journal* and the public press during the year 1898, calling attention to the discovery of the scale insect pest, known as the Orthezia insignis, in the suburbs of Cape Town. It was hoped that through tho active measures then taken, the outbreak had been nipped in the bud, more especially as an inspection of the various floral establishments in town had failed to reveal the presence of the pest. Unfortunately this hope has not been realised, and the insect has now again made its appearance in a Lantana hedge near the Camp Ground, Rondebosch, and in several similar hedges on an old estate in Mowbray, and it is probable that it has already become widespread. Much of the young growth of the Lantana is killed by the Orthezia, and the wood and remaining foliage becomes discoloured by a soot-like fungus that grows on an exudation from the insect, entirely spoiling the appearance of the hedge. Orthezia insignis is particularly partial to the lantana, but is also frequently found on other garden plants, such as verbena, lavender, fuschias, etc., and is death to the coleus. With a view to prevent, as far as possible, the spread of the pest, the public are recommended not to plant hedges of lantana, and are urged to take active measures for checking the spread of the scale by rooting up and destroying a hedge as soon as the appearance of the scale insect therein is noticed.

We are expecting peace daily, but in the meantime our search-light plays around here every night as usual.—Yours truly,

H. BAYLEY.

[Tea has enough to fight with; and lantana near Peradeniya and Gampola has been freely destroyed to prevent the scale insect pest spreading. —Ed. *T.A.*]

THE NEW MANURE.

London, E.C., June 13th, 1902.

Sir,—I enclose a copy of a reprint of my paper in the "Bath and West of England Journal," and on page 14 you will see an account of the experiments with radishes dressed respectively with ordinary superphosphate and with the new manure, basic super.—Yours truly,

JOHN HUGHES.

[We quote as follows:—

The manure has been sold during the last season n 187 places in England, 72 in Scotland, and 13 in Ireland. Many of the deliveries were in quantities of ten to thirty tons, so that the actual trials must have been more numerous even than these figures suggest. Notwithstanding the late application of the manure, due to the short time during which it has been on the

market and also to the very dry season, the reports received have been generally satisfactory and most encouraging. The first experiment made public was conducted by Mr William E Bear, of Hailsham, Sussex, and though only on a small scale deserves to be noticed on account of the care with which the comparative trials were carried out, and because the soil had previously been fully analysed by Dr. Dyer, whose results add very much to the value of the experiment. It is unfortunate that such soil analyses are too often omitted in manurial experiments.

DR. DYERS ANALYSES OF THE SOIL IN WHICH THE RADISHES WERE GROWING.

	Top-soil.	Sub-soil.
Silicious matter insoluble in strong hydrochloric acid ...	87260	84·560
Alumina	3260	5·580
Oxide of iron	3477	5·141
Lime	683	·216
Magnesia	260	·200
Potash	179	·285
Soda	082	·121
Phosphoric acid	083	·059
Sulphuric acid	024	·024
*a*Organic matter, carbonic acid water of combination, etc. ...	4·692	3·784
	100·000	100·000
*a*Containing nitrogen ...	·141	·048
The potash includes—		
Potash dissolved by a dilute (1 per cent) solution of critic acid, (probably "available" potash)	·003	·001
The phosphoric acid includes—		
Phosphoric acid dissolved by a dilute (1 per cent) solution of citric acid (probably "available" phosphoric acid) ..	·006	·001

Mr. Bear, who has kindly allowed the analyses to be used for the purpose of this paper, in a communication in the *Agricultural Gazette* of July 15th, 1901, headed "An Experiment with Basic Superphosphates," over the letters W E B, wrote as follows:—

"Soil from a field somewhat deficient in lime was placed in two $4\frac{1}{2}$-inch flower pots, and in one $\frac{1}{3}$ oz of basic superphosphate was placed, while an equal quantity of ordinary superphosphate (30 per cent soluble phosphate guaranteed) was put in the other. On June 8th, thirteen seeds of French breakfast radish were sown in each pot. Nine grew in the basic pot, and seven in the other. From the first the radishes in the basic pot grew away from the others; and, on being pulled and washed, seven (taken as they came out of the basic pot) weighed $2\frac{1}{2}$ oz, tops included, while the seven out of the other pot weighed only $1\frac{1}{2}$ oz. In each case the scale (a letter-weigher) plumped down well, so that there may have been an eighth of an ounce more of each. However, seven of the radishes grown with basic superphosphate weighed 66 per cent more than an equal number grown with ordinary superphosphate in the same kind of soil, although the soil and manure of the basic pot had to support two more plants than those of the other pot." The proportions of manure employed in the above experiments calculated per acre are certainly much more than would be applied in ordinary farming. but as the same quantities of the two manures were used in each case it is evident that basic super was the more suitable manure for the soil. The important point to notice in connection with these results is that the soil represents exactly the description of land upon which the new manure is most likely to produce an improved yield. for it contains considerably less than 1 per cent of lime, the figures being ·683 in the surface and ·216 in the sub-soil.

—Ed. *T.A.*]

GREVILLEAS (THEIR VALUE AS TIMBER) AND WHAT THEY ARE SUFFERING FROM.

Maskeliya, June 16.

(*To the Editor, "Tropical Agriculturist."*)

SIR,—I enclose copy of a letter I wrote to Mr. Carruthers about the Grevillea tree which may or may not be of use to you.—Yours faithfully,

R. MACLURE.

(*Copy.*) Maskeliya, June 9, 1902.

DEAR MR. CARRUTHERS,—I am sending one of my young Grevillea trees with the symptoms (rustiness of the foliage) which are so common amongst them here. I shall be glad to know if this tree has any canker or fungus, or whether you think it is merely a case of uncongenial surroundings. I have isolated pronounced cases of canker among my older trees. There is no mistaking them. I suppose it is better, when they are very far gone, to uproot these trees to prevent the spread of the canker. You said you came to our meeting the other day to get information. I am afraid you did not get much, but I will try and give you all the information, such as it is, I possess about the tree. A good many men think it is not worth growing, or taking any steps to combat disease. On some places, in this district and elsewhere, the growth is certainly poor, but even in such cases I think a good deal can be done by cultivation. Here they have been a source of great profit to the estate. I have sawn up over 30,000 feet of planking out of the older trees, and hope to saw at least 20,000 feet more in the next two years. The planking makes excellent withering tats, and, if planed and polished, the wood makes beautiful furniture. I reckon a Grevillea tree at 15 years old is worth R3·40 in ordinary soil, less in poorer soil, and much more in richer soil, such as they have in some parts of Dimbula. I arrive at this valuation as follows:—

Value of planking which a tree of 15 years will give, 60 feet at R8 per 100 feet, advertised price	R4·80
Less cost of sawing at R4 per 100 feet outside rate	R2·40
	R2·40
Value of balance of tree as firewood, ½ cubic yard at R2 per cubic yard	R1·00
	R3·40

There is then the value of the Grevillea tree:

1. For timber and firewood.
2. To improve the soil it takes from the subsoil and adds to the surface soil by the deposit of leaves.
3. This deposit not only adds to the soil but prevents wash and the growth of weeds.
4. As a windbelt in exposed places.
5. To diversify the cultivation. We were told, when leaf disease attacked and ruined our coffee, that—in planting it up, as we did, in one unbroken sheet, with no trees or belts of timber interspersed,—we transgressed the laws of nature, and suffered in consequence. We were careful to avoid this mistake when planting Tea.

My idea is that, although canker is certainly prevalent, and perhaps increasing, with the great majority of the trees with this "shuck" appearance, it is simply a case of the "survival of the fittest." The tea, as it is getting older, is taking more from the soil at the expense of the Grevilleas. In some places the latter are far too thick, a judicious thinning out of the weaker trees would improve matters. Where a Grevillea tree is being crowded out by the tea growing too close for its comfort, I would not hesitate to sacrifice the tea. A tea bush is worth at the outside 4 cents. Then a little application of cattle manure or artificial manure, or even silt from the drains, forked in, would help the trees.

I do not know whether all this will be of any value to you; it does not bear much on disease, but my idea was more to try and demonstrate that Grevilleas are worth some care and attention and not to be despised.—Yours very truly, &c.

R. MACLURE.

"THE ALLEYN SYSTEM OF PLUCKING."

July 1.

SIR,—"Old Harry"'s letter does not call for an answer on my part, for your footnote is already quite a sufficient refutation of his somewhat confused ideas. Yet at the same time I cannot refrain from protesting against his insinuation that a saving of thirty per cent in cost of plucking, as compared with neighbouring estates, is explainable by a casual reference to superior management or to over-manuring.

The first statement is decidedly uncalled-for and is, I consider, in the worst possible taste. It reflects not only on the planters of this district, but also on the general planting community, and would imply that, unless a superintendent can pluck at the Merria Cotta rates, he is incompetent to manage an estate. For on a property of average size the difference in the majority of cases varies from R3,000 to R6,000 on the year's working; and if by better management it is possible to show a saving such as this, the sooner a change in the superintendence is made the better for all concerned.

It might surely have occurred even to "Old Harry" that such a theory as the above is much more difficult to credit than the simple and actual explanation, viz., that the system of plucking advertised is "per se" *novel, and a great improvement on existing methods.* As regards the second statement, that the results obtained are due to over-manuring, it may be mentioned that a considerable proportion of Merria Cotta has not so far been treated. Further it is worthy of notice that some of the neighbouring estates in the district spend over 6½ cents per lb. of made tea in cultivation. Yet the cost of their plucking varies from 8½ to 9½ cents or more. Our actual increased expenditure on artificial manure for the past two seasons averages *under* R13 per acre per annum, excluding cost of experimental work.

That such experimental work will prove itself not only of benefit to our Company, but also of advantage to the tea industry in general, I have no hesitation in affirming. Later on, when certain arrangements are completed, your readers will have full opportunity to judge of the truth of this statement.

Again, if your unusually low cost of plucking is capable of such a simple explanation as your correspondent would have one believe, it is to say the least of it remarkable that the system should be in such general demand by the leading firms in Colombo and by the majority of the most experienced and practical planters in the island.

Those who have the best opportunity to judge of the value of our results—that is to say the agents of the estate, Messrs. Geo. Steuart & Co., and Mr. Joseph Fraser, who visits the property—have been among the foremost to accord me a full measure of support. Further proof of the utility of the methods advocated, if such were needed, is to be found in the fact that estates aggregating over 75,000 acres in tea have already applied for particulars of my "system of plucking."—I am, sir, etc,

HENRY M. ALLEYN.

TEA SALES—LOCAL AND LONDON—AND THE "AVERAGES" AS REPORTED.

July 1.

Dear Sir,—In looking over last week's Sale list and your paragraph showing the highest averages secured in the previous week's local sale, I notice that some estates' tea averages were mentioned, that I am rather inclined to think should not have been, for the following reasons:—I see (omitting names) *A.* was mentioned with *36 cts.* average for *four grades* sold; *B.* was mentioned with 45 cts. average with three grades; *C.*, 41 cts. with three grades; *D.*, 41 cts. with two grades; *E.*, *not* mentioned with five grades and 40 cts. I think you will agree with me on consideration of this point that it would be well in future to start something quite new with regard to mentioning estates' averages weekly, *i.e.* to mention the Estate Name, No. of Grades in the Tea Sale, and the Average Price of the Invoice sold calculated on the number of grades in, which would then be seen at a glance by the public. It would not as now lead to the conclusion often jumped at that such or such an estate has a good average without looking into the matter to see whether that estate or this has more grades or less than the other; which is not quite as it should be in my opinion. I should, therefore, be pleased if you could see your way to effect this alteration in future from this week forward, as I think it would be a capital arrangement and quite fair to all: which in my humble opinion is not the case with the London announcements.

It would be well if London Brokers could have this matter suggested to them by the local press. Often an estate is criticised on the fact that they are not on the "line" of prices in averages, because on the one hand an estate sends all grades, whereas another estate sends its best grades for sale and is mentioned as having secured such fine prices. This report is a misleading account of the true state of the average for that estate, properly speaking, and other estates should be mentioned that are not, for the reasons stated. The Superintendents again are often questioned as to why they cannot secure such fine prices as so and so. I think you will readily see the force of my arguments, that all should share on their true merits and not calculations based on artificial averages. —I am, Dear Sir, yours truly,

A PLANTER.

[We made a reference back in connection with the foregoing letter, and "Planter" writes further:—

"The inclination is to crack up an estate or its Manager, because his estate is on the "line" of averages, whereas that same estate might sell only its best grades in order to be mentioned and its worst grades under an assumed name or another time. Many estates sell what is termed, I believe, regular sampling breaks with everything in, and if their average was weighed on its merits, in all probability would be found a much better criterion as to what an estate, only selling its upper grades, is accomplishing. To put the matter in a nutshell, the present system is misleading in the majority of cases and therefore serves no good purpose in my humble opinion; but merely shows up at a glance those on the board, while you constantly hear so-and-so is on the gallery this week, whereas probably someone else should have been there instead. Many do not take the trouble in these hurried days to look through the number of grades and therefore jump at the conclusion that as such or such an estate is on the board, it is necessarily the best sale. The inside often reveals otherwise. If the mentioning of estate averages is not conducted on sound principles, do not you agree with me that it would be best to discontinue the mentioning of any estate on the outside leaf of either London or local sales? The Press or the Brokers, I feel sure, only wish to play fair to all and not to a select few,—which is not transacting business in the impartial way—which the press have the character of doing. I hope you agree with my view, for I feel rather strongly on the matter—not for myself, but I have so frequently heard estates and its Managers criticised on the merit of being mentioned, with perhaps three grades in, and another with double the number, or say two more, a half-penny less in average, passed over."
—Ed. *T.A.*]

OVERPRODUCTION AND MANURES.

July 7th.

Sir,—It seems to me absurd and irrational to advocate at this time of day—as a correspondent to your contemporary does—the exclusion from the island of so-called "forcing manures." How are they to be defined as contrasted with the sustaining manures which are to be admitted *free*! I suppose rotten fish, castor cake and bones are *forcing* as well as *sustaining* manures; but they are simply indispensable to the maintenance of our industry. I doubt if there is any manure imported that "Science," as represented by Mr. Kelway Bamber, would condemn as injurious to the tea bush.—Yours truly,

PROPRIETOR NO. 2.

CEYLON LANDS SUITABLE FOR GREEN TEA.

Cochin, July 8.

Sir,—With reference to your comments on my remarks when interviewed by *Indian Gardening and Planting*, in yours of 2nd July, by my saying Ceylon had no very large amount of land suitable for green teas I intended to imply that it was probable that with the increase in price of high-grown teas, resulting from export of say 10 millions green tea in that country, and perhaps a larger quantity for India, only low-elevation gardens would continue green tea manufacture. By suitable lands, therefore, I mean land at low elevations in forcing climate where the flushes are very heavy and rapid and quantity rather than quality is of necessity the result.—I am, Sir, yours faithfully,

H. DRUMMOND DEANE.

CEYLON COCOA AND ITS WANT OF AROMA.

Kandy, July 14.

Sir,—The annexed memorandum regarding Ceylon cocoa is sent for publication as of interest to cocoa growers and others.—I am, Sir, yours faithfully,

A. PHILIP.

Secretary, Ceylon Planters' Association.

CEYLON COCOA

is objected to by manufacturers in Germany on account of its want of aroma. One manufacturer told me some time ago he feared we washed it before drying and thus all the mucilage on the pod was taken off. He now advises me he has induced a Java firm to give up the washing of the bean both before and after fermentation. It is dried in the pod and he maintains that the first consignment treated in this manner gives a quality vastly superior to any sent hitherto from Java. He recommends the Ceylon planter to give up all and every washing of the bean.

(Signed) J. H. RENTON.

GREEN TEAS AND ——GREEN TEAS

The Watte, July 15.

Dear Sir,—Is it, or is it not, a fact that medium and high-grown Ceylon "green teas," if treated according to the Japanese plan, —which does not impair the purity of the tea, —will fetch a price far above that got for common green teas ?—Truly yours,

WILLING TO LEARN.

[We think our answer may be in the affirmative, judging by the prices already got for the greens manufactured at Ambewatte Mills. But then it is not open to the ordinary planter to import an expert, or to get a hold of the secret at present monopolised in Ceylon in the aforesaid mills, whereas ordinary greens by Mr. Drummond Deane's method can be made with little trouble in any ordinary factory. This is how we understand the matter at present.—Ed. *T.A.*]

GREAT WESTERN TEA COMPANY.

REPORT OF THE DIRECTORS.

The Directors submit their annual Report and Accounts for the season ending March 31st, 1902.

The yield of Tea has been 440,978 lb being an increase of 12,468 lb on last season's crop: the price realised on 406,485 lb for which account sales have been received at 46·91 cents per lb., against 48·91 cents last season and 48·96 cents in 1899-1900; but telegraphic advices shew that the balance of the crop has sold at a net average of 8·61 pence, making the average for the whole crop about 47·37 cents, which in view of the lower range of prices is satisfactory.

The cost F O B Colombo is 29·05 cents per lb. (including 3·80 cents for manuring) against 31·71 cents (including 4·77 cents for manuring) last season.

The amount available for distribution, after setting aside R6,833 70 for depreciation, is	R 74.283·75
out of which the Directors recommend the payment of a dividend of 11 per cent absorbing	64,240 00
To place to Reserve Account a sum of	7,500 00
And to carry forward the balance of ..	2,543·75
	R74,283·75

The result of the year's working is better than that of the previous season in spite of a lower market, while the general condition of the Estate is at the present time still further improved, and the Directors wish to record their appreciation of the good work done by the Superintendent.

The Estimated Crop for the current season is 430,000 lb to cost R128.689·38 being at the rate of 29·92 cents per lb. tea inclusive of 3·10 cents for manuring, and this the Directors consider a safe Estimate.

The acreage of the Estate is :—

A.	R.	P.	
921	2	12	Tea in bearing.
39	0	0	Fuel Clearing.
38	2	4	Ravines.
17	1	12	Grass Field.
11	3	13	Building and Gardens.
30	0	14	Cart Road and Roads.
23	2	25	Railway
Total 1,082	0	0	

During the year Messrs. A Cantlay and James Ryan retired on leaving the Island, and Mr. John Anderson was appointed on the Board.—In terms of the Articles of Association Mr. J C Dunbar retires by rotation and being eligible offers himself for re-election.—It will be necessary to appoint an Auditor for season 1902-1903.

By order of the Board of Directors,

THE DECLARATION OF A DIVIDEND: 11 PER CENT.

J M Robertson & Co.
Colombo, June 11. Agents & Secretaries.

AMALGAMATED TEA ESTATES COMPANY, LIMITED.

Report for the year ending 30th November, 1901, to be submitted to the sixth annual ordinary general meeting of Shareholders of the Amalgamated Tea Estates Company, Limited, to be held in the Registered Office of the Company, 22, West Nile Street, Glasgow, on Thursday the 19th day of June, 1902, at 2 o'clock p.m.

Directors :—Mr A K Muir, Chairman, Sir Robert D Moncreiffe, Bart, Mr A B Murray, Mr A M Brown, Mr Robert Scott, Mr R H Sinclair and Mr J F Muir.

The Directors beg to submit the accounts for the year ending 30th November, 1901.

The crop gathered from the Company's estates was 2,763,574 lb compared with 2,582,657 lb in 1900. The average price obtained was very disappointing, being only 9·27d against 9·90d and 10·29d respectively in the

two previous years. Unfavourable weather in the Darjeeling district, which seriously affected the quality, and an unusually low range of values for Darjeeling Tea, generally, in the London market, were the main causes of this regrettable fall in price. Adverse weather similarly affected the results of the Anglo-American and Kanan Devan Companies, in which this Company is largely interested.

For some considerable time past, in view of the adverse circumstances affecting the Tea-growing Industry, the directors have had under consideration the terms of the agreement between the Managing Agents and the Company. While it was recognised that at the time the agreement was entered into its terms were reasonable, the Agents, on being approached, expressed themselves as perfectly willing to consider a re-arrangement, and they voluntarily offered in future, during the continuance of the present depression in tea, and, while reserving their rights under the agreement, to restrict their charges as Agents of this Company to their actual outlay, plus a commission of 3 per cent on the uett profits.

The Managing Agents have also, in view of the disappointing results of last season's working, voluntarily agreed to give up to the Company, for the benefit of the Revenue Account of 1901, the whole of their Commissions for that year; and the London Agents have also agreed to return one-half of their Commissions.

Giving effect to the above concessions, so far as they affect the year under review, the Accounts now submitted show a balance at credit of Profit and Loss account of £31,900 : 10 : 4, against which are chargeable:—Commission on Profits to Estate Managers and Secretaries, Interest, Discount on Bills, &c., and Dividend at the rate of 5 per cent. per annum for six months ended 31st May 1901, paid to the Preference Shareholders on 15th June 1901, which total £18,897 : 15 : 1, leaving a balance of £13,002 : 15 : 3. The Directors propose to transfer £5,000 to Reserve Account, leaving £8,002 : 15 : 3 to be carried forward to next year.

The planted area of the Company's properties is now 13,494 acres. No extensions are in hand or contemplated.

The estimate of yield for the current season is 3,175,280 lb of Tea. The increase expected is mainly from the Company's young Estates in Assam which are now coming into bearing, and which being planted with a high-class jat of Tea should help to improve the average price of the Company's produce.

[Here follow paragraphs identical with those in the "Consolidated" Company's report quoted yesterday, alluding to foreign markets consumption and Mr A K Muir succeeding Sir John Muir as Chairman.—Ed.*T.A.*]

In terms of the Articles of Association, one of the Directors, Mr Robert Scott, retires at this time, and is eligible for re-election. The Directors regret that Mr A B Murray finds it necessary to retire on account of his health, and they have considered the question of filling his place. They approached Mr D M Hannay, of Messrs Kelly & Co., Exchange Square, Glasgow, and he has expressed his williugness to be nominated for a seat on the Board.

The Auditors, Messrs. Alexander Sloan & Co., C A, retire, and offer themselves for re-election. By order of the Directors. JAMES FINLAY & Co.,

Glasgow, 11th June, 1902. *Secretaries.*

THE ANGLO-CEYLON AND GENERAL ESTATES COMPANY, LTD.

REPORT OF THE BOARD OF DIRECTORS.

To be presented to the stockholders at the sixteenth annual meeting to be held at 20, Eastcheap, London, E.C., at noon on Thursday, July 10th, 1902.

The Directors herewith submit their report, and the accounts for the year ending 31st March, 1902.

The net profit, with the balance of profit carried forward from the previous year, after debiting the debenture interest, as shown in the audited accounts annexed hereto, amounts to £21,311 19s 7d, and the Directors recommend a payment thereout of a dividend of four per cent on the Consolidated Stock of the Company, leaving a balance of £11,311 19s 7d, to be carried forward. It is proposed to pay the dividend on the 11th July, 1902.

The year in Ceylon was by no means favourable to the tea industry. The crop, which in the previous year amounted to 2,180,675 lb. from the estate leaf, and 133,672 lb. from the bought leaf, consisted in the present year of 2,269,718 lb. of estate, and 87,384 lb. of bought leaf. The crop of cocoa was a short one, owing to drought, and amounted to 1,570 cwts. as against 2,285 cwts. in 1900-1901. The gross price of the Company's tea was equal to 7·39 pence per lb in the London market, as against 7·68 pence per lb in the year 1900-1901; but it compares well with the Ceylon average. The price realised for cocoa was 58s 6d per cwt, as against 74s 3d in the previous year.

In Mauritius the crop of canes was somewhat disappointing and difficult to work, and this combined with the exceptionally low prices, which resulted from the excessive supplies of beet sugar, made the year comparatively unremunerative. In all 76,698 tons of cane were handled on the estates in which the Company is interested, and produced a crop of 7,553 tons of sugar, as against 8,565 tons in the year 1900-1901.

The result of the working of the estates in Ceylon and Mauritius, respectively, is given in the profit and loss account, calculated at the average rate of exchange of 1s 4 3-16d, as against 1s 4¼d in the year 1900-1901.

The crop prospects of the current year, and the condition of the estates, both in Ceylon and Mauritius, are reported to be good; and a favourable feature in the outlook of Mauritius is the recent imposition of additional duties on beet sugar imported into India, with a view to countervail the large kartel bounties of Germany and Austria. From Selangor the reports of the progress made by rubber, coconuts, and other products, continue satisfactory. A statement of the acreages is given in the schedule annexed hereto.

Mr. Stuart C Mackenzie, K.C., under the provisions of the Articles of Association, retires from the Board, and, being eligible, offers himself for re-election.

The auditors, Messrs. Welton, Jones & Co., also retire from office, and have expressed their readiness to act, if re-elected.

BOGAWANTALAWA DISTRICT TEA COMPANY, LIMITED.

Report.—To be presented at the fifth ordinary annual general meeting of the Company, 2nd July.

The Directors have the pleasure to submit the balance sheet and accounts of the Company for the year ending 31st March, 1902, duly audited.

The yield of tea fell short of the estimated quantity by 53,414 lb., the shortfall being attributable to the great deficiency in rainfall as compared with the average. The profits for the year were also affected by the further fall in the price of tea, the market having continued in a very unsatisfactory state. The expenditure was as low as could be expected under the circumstances, and includes the amount spent on new clearings, buildings and machinery.

The total yield was 1,134.586 lb. tea plucked off 2,185 acres, being at the rate of 519 lb. per acre all round, costing free on board at Colombo 24 cents or 4d per lb.. The gross average price of the 1,118,555 lb. sold in London was 7.22 per lb,

The crops for the current season are estimated at 1,206,000 lb. tea.

The gross average at which drafts were negociated was 1s 4 3-16d per rupee against 1s 4¼d in the previous year.

The Directors desire to place on reoord their appreciation of the services of their Manager and his Staff in Ceylon.

STATEMENT SHOWING RESULTS OF WORKING FOR THE FOUR YEARS ENDING 31ST MARCH, 1902.

Season.	Acreage plucked	Total Tea Crop.	Yield per Acre.	Cost of Crop per lb. f. o.b. Colombo.	Gross Avg. per lb. Tea sold in London	Average rate of Exchange per Rupee.	Dividends. Preference.	Dividends. Ordinary.
	Acres.	lb.	lb.	d.	d.			
1898-1899	2,081	1,031,782	495	4·12	8·71	1/4 5-32	6	7½
1899-1900	2,185	1,209,451	553	3·69	7·98	1/4 5·16	6	7½
1900 1901	2,185	1,236,272	565	3·93	7·51	1/4¼	6	6
1901-1902	2,185	1,134,586	519	4·00	7·22	1/4 3-16	6	4

The profit for the year amounts to £10,354 3s; To which has to be added Interest £160 2s 1d; And the Balance from last year of £753 2s 3d. Total £11,267 7s 4d.

Interested on the Mortgage Debentures has been paid, *less* Income Tax £395 10s; Dividends on the 6 per cent Preference Sharos for the 12 months were paid on the 1st Oct. 1901, and 2nd April. 1902, *less* Tax £5,254 10s; Income Tax to April 1902 has becu paid £848 8s: It is Proposed—To pay a Dividead of 4 per cent on the Ordinary Shares, which will require *less* Tax £3,766 13 4d; To transfer to Reserve (increasing this account to £5,000) £500; And to carry forward to next year the balance of £502 6s. Total £11,267 7s 4d.

The Director retiring on this occasion is Mr Henry Bois, and being eligible he offers himself for re-election.

Mr. John Smith, the Auditor, also retires and offers himself for re-election.—By Order of the Board,

ROBERTSON BOIS & Co, Agents and Secretaries.
12, Fenchurch St., London, E.C., 20th June, 1900.

SCHEDULE OF THE COMPANY'S ESTATES.

Estates.	Tea, full bearing.	Tea, not in bearing.	Forest.	Grass.	Chena and Patena.	Total.
Kirkoswald	756	35	74	12	—	877
Bridwell	382	36	35	5	15	473
Elbedde	705	—	27	15	—	747
Bogawana	341	26	44	6	18	436
Total	2,185	97	180	38	33	2,533 acres

THE CONSOLIDATED TEA AND LANDS COMPANY, LIMITED.

REPORT for the year ending 30th November, 1901, to be snbmitted to the Sixth Annual Ordinary General Meeting of Shareholders of the Consolidated Tea and Lands Company, Limited, to be held in the Registered Office of the Company, 22, West Nile Street, Glasgow, *on Friday, the 20th day of June, 1902*, at Two o'clock p.m.

DIRECTORS:—A. K. Muir, Esq., *Chairman*, Sir Robert D. Moncreiffe, Bart., A. B. Murray, Esq., A. M. Brown, Esq., Robert Scott, Esq., R. H. Sinclair, Esq., D. M. Hannay, Esq., J. F. Muir, Esq.

The Directors beg to submit the Accounts for the year ending 30th November, 1901.

The crop of tea from the company's estates was 11,742,418 lb, or 1,590,836 lb less than that gathered in 1900. A rather finer class of leaf was taken off the bushes, but the main cause of the shortage was the severe drought experienced chiefly in Sylhet at the beginning of the season under review. A slightly higher price has been obtained for the produce, viz., 6 67d per lb, against 6·43d per lb in 1900, or an improvement in price of about ¼d per lb, but in view of the shortage in the general output from India and Ceylon, it is disappointing that better prices have not been forthcoming. Unfavourable weather similarly affected the crop returns of the Kanan Devan and Anglo-American companies, in which this company is largely interested. For some considerable time past, in view of the adverse circumstances affecting the tea-growing industry, the directors have had under consideration the terms of the agreement between the company and its managing agents in Calcutta and Colombo. While it was recognised that, at the time the agreement was entered into, its terms were reasonable, the agents, on being approached, expressed themselves as perfectly willing to consider a re-arrangement and they voluntarily offered in future, during the continuance of the present depression in tea, and while reserving their rights under the agreement, to restrict their charges as agents of this company, and of the other tea companies in which this company is interested, to their actual outlay plus a commission of 3 per cent. on the nett profits. This offer, which the directors regard as a most favourable one for the company, would, of course, supersede the arrangement with the Calcutta and Colombo Agents roferred to in the directors' report for yoar ended November 30, 1899. With the view of enabling the directors to make up the full sum drawn from the reserve account, and place the company again in a dividend-paying position as soon as possible, the managing agents have voluntarily agreed to give up to the company, for the benefit of the revenue account of 1901, the whole of their commissions for that year. The directors have returned one-half of their fees, and the London agents have also returned one-half of their commission. Giving effect to the concessions referred to in the preceding paragraph, the accounts show a balance at credit of profit and loss account of £79,053 1s 9d. Against this sum are chargeable: Commission on profits to managers of estates and secretaries, interest and discount on bills, &c., interest and proportion of charges on debenture stock and income-tax, amounting together to £35,363 11s 9d. This will leave a balance of £43,689 10s, of whioh £41,634 0s 7d will fall to be replaced to the reserve fund in accordance with the resolntion to that effect passed at the annual general meeting of the compauy held on August 30, 1901. The reserve fund will, with that addition, stand at £65,000. The balance remaining at credit of profit and loss account —namely, £2,055 9s 5d—the directors propose should be applied in reduction of the amount standing at the debit of preliminary expenses account. No exteusions are in progress or contemplated, and the planted area of the estates of the company, which have now been practically all surveyed by European Surveyors, aggregates 28,473 acres. The estimate of yield for the current season is 13,572,880 lb. The weather upon the whole has, so far, been generally favourable to growth, in consequence of which an improvement is already noticeable in the out-turn. The estates of the company are in excellent condition, and when the present crisis is over they will undoubtedly again earn good profits, especially as, in spite of hard times, they are being cultivated and upheld as liberally as ever. Efforts continue to be made to increase the consumption of Indian and Ceylon teas in oountries other than the United Kingdom, and espeoially in America and Russia; while a strenuous endeavour is being made by producers in India, including this company, to encourage tea drinking amongst the native poulation, and it is hoped that in time an appreciable quantity of tea

will be consumed there. Moreover, there are signs that Indian and Ceylon growers in addition to realising the necessity of opening up new markets, are also now more inclined to look with favour on a combination for, amongst other things, a general restriction of output for a year or two. The directors are hopeful that some scheme may be brought forward which will bring together the greater part of the industry, and they are prepared to send their cordial support to any feasible proposal. Such a combination would undoubtedly tend to at once raise the price of tea. The directors regret to state that Sir John Muir, who has acted as na chairman of the Company since its formatio, has been obliged to resign as a member of the board on account of the state of his health. They hope that after a time he may be able to again preside at their meetings. In the meantime. Mr A K Muir, who was offered and accepted a seat on the board, has agreed to act as chairman. Mr Muir has been in India for the last eleven years, latterly as senior manager of the Calcutta agents' firm, and during the greater part of that time has been connected with the management of the company's estates. In terms of the Articles of Association two of the directors, Mr A B Murray and Mr R H Sinclair, retire at this time. The directors regret that Mr Murray finds it necessary to retire on account of his health, and they have considered the question of filling his place. They approached Mr J T Tullis, of Messrs John Tullis and Son, Limited, Glasgow, and he expressed his willingness to be nominated for a seat on the board. Mr Sinclair is eligible for re-election.

The Auditors, Messrs. Alexander Sloan & Co., C.A., and Messrs. Jackson, Pixley, Browning, Husey & Co., C.A., retire and offer themselves for re-election.

James Finlay & Co.,
Secretaries.

Glasgow, *12th June, 1902.*

PLANTING NOTES.

Honolulu in the Hawaiian Islands—as the result of 13 years' Observations shows an average temperature in the shade of 74·11, the extremes being 57 deg. in February and 87 deg. in August. The rainfall is very low—only 28·39 inches as the annual average of 18 years: the maximum 49·82 and the minimum 13·46 inches. The place of observation is 50 feet above sea level. All this we learn from tables in the "Hawaiian Planters' Monthly."

Scientific Production and Manufacture.—Commenting on the Review of the Trade of India by J E O'Conor, Director-General of Statistics, the *Pioneer* of July 10th says:—In all the great staple industries of India—in tea, indigo, cotton, sugar, etc.—the time has come for the application of up to-date scientific production and manufacture, and India can only hope to hold her own in so far as she makes use of labour saving methods and of the advantages which science places at her disposal. In discussing the export of animal bones, which averages about 100,000 tons annually. Mr. O'Conor says that Indian bones are also sent to Ceylon, where they fertilise the fields on which is grown the Ceylon tea that undersells Indian tea—not only out of India, but in India itself. This statement of the facts seems to point to the absence of capital, skill, and enterprise in undertakings dependent on agricultural operations.

Thirty Thousand Young Trout—this season's hatch at the Matlock Fishing Association's hatcheries, have been destroyed. The cause is attributed to poisoning by river pollution. The association has appealed to the Government for an official inquiry to be held.—*Morning Leader*, June 14.

The Holta Tea Company of Kangra Valley report that encouraging results followed in the manufacture of 20,000 lb. green tea for the American market last year. This year it is proposed to make 60,000 lb. of the same. For this purpose the Company have installed the Drummond Deane system and machinery, which is a good testimonial, coming as it does from a Kangra garden.—*Indian Gardening and Planting*, June 26th.

Sugar Growing in the East Indies.—Mr. R. W. Egerton Eastwick, lately secretary to the Penang Chamber of Commerce and Agriculture, writes to the London *Times* of May 21st on the subject of the existing depression in the sugar industry in the West Indies. At the very outset he denies that the depression will cease when the bounties have been abolished. To support his assertion he points out that although the prosecution of the industry has ceased to pay in the West, yet in the Eastern part of the Empire sugar-growing is regarded as a profitable undertaking. "In British Malaya" he goes on, "encouraging results have long since been succeeded by permanent prosperity." He points out that the conditions under which the industry is followed in the West Indies and in Malaya are very similar. Both countries, he allows, will benefit by the abolition of the bounties but not to any appreciable extent, "but the change which would materially benefit the West Indies is one of currency. A silver currency prevails In British Malaya, where labour is paid in silver. Might not the gold standard be dropped in the West Indies, and might not British and Mexican dollars take the place of sovereigns, with a varying rate of exchange?

The Real Rubber Tree.—The so-called rubber tree, with its thick, glossy, green leaves, common in hot-houses and gardens, is that which produces the gutta percha. It is little like the great tree from which comes the best rubber of commerce. The real rubber tree is not unlike other forest trees, resembling the English ash and growing to a height of more than sixty feet. Its bark is silvery gray, where it has not become black from being tapped. Its trunk is about as big as a man's waist. Where it has been tapped it often swells out at the base, so that it is much larger. It blossoms in August, being then covered with little white flowers. It bears nuts and in December and January, when they are ripe, the shells burst with a noise like a fire-cracker, throwing the nuts some distance. There are so many nuts on each tree that a man could easily gather enough in a day to plant a hundred acres of land. The tree can be easily grown in the right soil, and they thrive without cultivation; but to yield rubber they must be 15 years old. Fifteen years is too long a time for a man to wait in Australia, and at present the trees which produce rubber are wild.—*Journal of Department of Agriculture, W.A.*

A RECORD BANANA EXPORT.—The Jamaica *Gleaner* reports that the exportation of bananas for the year ending March last is likely to amount to a total of over ten millions of bunches, a record for Jamaica. The returns are compiled according to the computation of the companies, so that two small bunches are counted as one bunch. The total number of actual bunches therefore greatly exceeds ten millions.—*W. I. Agricultural News*, June 7.

BUDDING ORANGES.—The practice of budding oranges is becoming a part of the regular routine at all the Botanic establishments in the West Indies. In the interesting *Bulletin* of the Botanic Gardens at Trinidad, January 1902, Mr. Hart writes :—" Some advance has been made in the propagation of the imported kinds of oranges during the present year, and a fairly good stock of strong budded plants is now on hand. This, it is trusted, will do away with the complaint, so frequently heard, of oranges proving sour when raised from seed, a case of which occurred during the present week. The stock used is that of the Seville orange which does not suffer in our climate from stem-rot or mal-di-gomma, as do the best of our St. Michael's and Tangerine kinds. The 'Washington Navel' is among the varieties successfully budded. I learn that in some instances the pupils who attended the recent Agricultural Lectures are meeting with fair success in budding and grafting.—*W. I. Agricultural News*, June 7.

COCONUT BUTTER.—The Journal of the Roya Horticultural Society for April contains this note on an article by Mr. J R Jackson, which appeared in the *Gardeners' Chronicle* for December 1901 :—This substance has lately attracted a good deal of attention ; its manufacture in this country [England] and on the Continent is now very considerable. It is manufactured from the kernels of coconuts, and is used as a substitute for butter or lard in cooking. It is sold in Germany at about 8d. per lb. It is claimed that it contains more than 90 per cent of vegetable fat, and that it is more wholesome and easier digested than the ordinary fat used for baking and cooking. It is said to be much in demand amongst vegetarians, Jews and Mahommedans. In English trade it is known as '*Nucoline.*'—We might add that coconut suet also figures in the English market under the name of '*Vejsu.*'—*W. I. Agricultural News*, June 7.

PRESERVING EGGS.—The following methods of preserving eggs are given in the July Part of " WORK":—Add 1 pt. of unslaked lime to 1 gal. of water, boil, stirring it well, then pour it into a bucket and allow to cool, and the lime to settle at the bottom. Now fill some glazed earthenware jars with new-laid eggs, then pour on the clear lime water to cover the eggs, tie a piece of bladder or some non-porous material over the top of the jars, and store away in a cool place. This is an old-fashioned method and it has the objection of making the shells brittle, and to some extent gives the eggs an unpleasant taste. Anything that will seal up the pores of the shell will preserve the eggs, and coating with white of egg, or painting with gum-water, or greasing, will keep them fresh for a time. At a recent show in Birmingham, some eggs were preserved by rubbing with vaseline and packing in bran, and some were rubbed with lard and packed in peat mould. Water glass is now often used for preserving eggs. Water is boiled and allowed to cool, then one-tenth of its bulk of water glass is added, and this is used in a manner similar to that employed with the lime-water described above.

FLOWERING OF THE VICTORIA REGIA AT KEW.—Notwithstanding the late season and the absence of bright sunlight, writes the head gardener, Mr Hawes, the Victoria Regia growing here opened its first flower on the 14th instant, Saturday last, and nearly a month ahead of last year. The leaves are already 5 feet 6 inches in diameter, and another flower will open in a few days.—*Gardeners' Chronicle*, June 21.

LAGOS SILK RUBBER.—The tree yielding this rubber is being gradually established in the West Indies. The name *Kickxia* has now been replaced by *Funtumia*, derived from the West African name of the tree. It is noticed that the young plants, if left to themselves, are liable to form a bushy habit and thus rendered less valuable for rubber-yielding qualities. To correct this it is recommended that the trees be pruned by gradually taking off all the lower branches and that one central, clean stem be encouraged. Even when the trees are tolerably large this is still required to be done if they are to be tested, as they should be, for yield of rubber. The Central American rubber tree (*Castilloa*) and the Lagos silk rubber tree (*Funtumia*) evidently are the most promising rubber trees for cultivation in the West Indies.—*W. I. Agricultural News*, June 7.

THE NAVEL ORANGE IN CALIFORNIA.—Referring to Mr Tidmarsh's note on p. 225 of your issue of April 5, I write to say that the Bahia, or as it is here called the Washington Navel, is the principal shipping Orange of California, furnishing over three-fourths of, 20,000 train-car loads of Oranges exported from California in the season of 1899-1900. With us it is a good bearer, but in Florida it is said to produce but shyly. It is by no means an infrequent occurrence to find a second Orange at the apex of the first, and all stages of development between the ordinary "Navel" and the well-developed second Orange are often found. Writing in *Meehan's Monthly* some time ago (the reference is not accessible to me), Prof. W W Bailey, of Brown University, says :—" We take it that in the Navel Orange the branch or shoot continues to grow, producing another tier of carpels above or within the first set. The lower set is more vigorous, presses upon and crowds the inner, forming, at last, the characteristic dimple or navel which gives the fruit its name. Such prolification of a flower-branch is seen any day in the two or more storeyed inflorescence of Chinese Primroses ; or in the still more striking cases where a Cherry, Rose, or Apple-blossom continues a leafy shoot through its middle." The figures refered to by Mr Tidmarsh are to be found on p. 56 of a publication of the California State Board of Horticulture, entitled *Culture of the Citrus in Calfornia*, by the late B M Lelong, Secretary, "assisted by experienced horticulturists" ; it was published in 1900. Another illustration will be found in Dr H J Webber's article on "Citrus" in Bailey's *Cyclopœdia of American Horticulture*, p. 322. Another account of the Bahia occurs in the same work under "Orange," pp. 1152 to 1160, together with other information of interest and value to Orange-growers. A more extended and thoroughly reliable account of the Orange industry in California is contained in Wickson's *Californian fruits and How to Grow them*, ed. 3, San Francisco, Pacific Rural Press, *Joseph Burtt Davy, Assistant Botanist, Agricultural Experiment Station, Berkeley, California.*—*Gardeners' Chronicle*, June 21.

CEYLON PLANTING AND COMMERCIAL COMPANIES.

RISE AND FALL IN THE SECOND QUARTER OF 1902.

RUPEE PRODUCE COMPANIES.

	Ordinary Capital. R	Market Value of Shares, Mar. 31. R	Market Value of Shares, June 30. R	Rise or Fall R
Agra Ouvah ...	375,000	600,000	626,250	+26,250
Castlereagh ...	240,000	228,000	204,000	—24,000
Ceylon Provincials	666,000	666,000	672,660	+6,660
Ceylon Tea and Coconuts ...	348,000	348,000‡	348,000‡	—
Claremont ...	65,000	— ‡	— ‡	—
Clunes ...	332,000	166,000	166,000	—
Clyde ...	270,000	81,000	81,000‡	—
Doomoo ..	400,000	280,000	270,000	+10,000
Drayton ...	715,000	1,072,500‡	1,072,500‡	—
Ella ...	300,000	82,500	75,000	—7,500
Estates of Uva...	710,500	269,990	291,305	+21,310
Gangawatte ...	178,500	178,500	178,500	—
Glasgow ...	325,000	614,250	617,500	+3,250
Great Western...	584,000	712,480‡	712,480*	—
Hapugahalande	170,000	170,000‡	106,250*	—63,750
High Forests ...	750,000	750,000	675,000	—75,000
Do. Part Paid	200,000	225,000	225,000‡	—
Horrekelly ..	400,000	225,000	320,000	—
Kalutara ...	400,000	200,000	160,000	—40,000
Kanapediwattie...	334,000	283,900	167,000†	—116,900
Kandyan Hills ...	125,000	56,250	50,000	—6,250
Kelani T. Garden	300,000	105,000	105,000	—
Kirklees ..	100,000	50,000	50,000*	—
Knavesmire ...	415,000	166,000	186,750	+20,750
Maha Uva ...	300,000	210,000	210,000	—
Mocha ...	404,000	565,600	626,200	+60,600
Nahavilla ..	396,500	237,900	237,900	—
Neboda ...	265,000	265,000	265,000†	—
Palmerston ...	410,000	328,000	328,000	—
Patiagama ...	80,000	—	—	—
Penrhos ...	150,000	127,500	112,500	—15,000
Pine Hill ...	208,740	139,160	139,160	—
Pitakande ..	310,000	310,000‡	310,000‡	—
Putupaula ...	200,000	240,000‡	240,000‡	—
Ratwatte ...	150,000	36,000‡	36,000‡	—
Rayigam ...	600,000	195,000	240,000	+45,000
Roeberry ...	300,000	210,000*	255,000	+45,000
Ruanwella ...	265,000	106,000	86,125	—19,875
St. Helier's ...	50,000	50,000†	50,000‡	—
Talgaswela ...	200,000	40,000	30,000†	—10,000
Tonacombe ...	280,000	168,000	182,000†	+14,000
Udabage ...	170,000	68,000‡	34,000‡	—34,000
Udugama ...	315,000	63,000‡	63,000‡	—
Union ...	320,000	70,400	70,400	—
Upper Maskeliya	350,000	350,000†	350,000‡	—
Uvakellie ...	240,000	144,000	144,000†	—
Vogan ...	720,000	270,000	360,000	+90,000
Wanarajah ...	378,000	756,000†	680,400	—75,600
Yataderia ...	190,000	541,500	570,000	+28,500
Total ...	15955240	13112430	12975880	—136550

RUPEE COMMERCIAL COMPANIES.

	Ordinary Capital R.	Market Value of Shares. Mar. 31. R.	Market Value of Shares. June 30. R.	Rise or Fall. R.
Adam's Peak Hotel ..	118,900	35,670	35,670	—
Bristol Hotel...	382,600	344,340	382,600	+38,260
Ceylon General Steam Navigation ...	75,000	165,000	157,500†	—7,500
Ceylon Ice & Cold Storage	450,000	450,000	517,500	+67,500
Colombo Apothecaries ...	400,000	580,000	530,000	—50,000
Colombo Assembly Rooms	27,520	20,640*	20,640*	—
Colombo Brick & Tile Co. ...	150,000	150,000	150,000‡	—

RUPEE COMMERCIAL COMPANIES.—(*Contd.*)

	Ordinary Capital. R	Market value of Shares. Mar. 31 R	Market value of Shares. June 30. R	Rise or Fall. R
Colombo Fort Land & Building ...	360,000	306,000	306,000	—
Colombo Hotels	500,000	1,375,000	1,400,000	+25,000
Galle Face Hotel	650,000	1,300,000	1,267,500	—32,500
Kalu Ganga Navigation ...	50,000	50,000	50,000‡	—
Kandy Hotels...	250,000	300,000*	325,000	+25,000
Mount Lavinia Hotel ...	350,000	210,000	210,000	—
New Colombo Ice ...	210,000	330,750	262,500	—68,250
Nuwara Eliya Hotels ...	42,000	42,000	46,200†	+4,200
Public Hall ..	35,000	21,000	17,500	—3,500
Total ...	4,051,020	5,630,400	5,678,610	—1,790

* Buyers' prices have been taken in the absence of transactions or sellers' quotations.

† Latest price during quarter, on quotation in latest list.

‡ No quotation during quarter.

We continue below the table we commenced on 30th June, 1900, showing the fluctuations in our investments since 1895, which will continue to prove of interest:—

TEA COMPANIES.

Appreciation and Depreciation since 31st December, 1895.

		Face Value of Shares. R.	Market Value of Shares. R.
31st December ..	1895	...13,529,114	21,522,921
31st December ...	1896	..13,529,114	22,954,372
31st December ...	1897	...15,938,040	17,115,435
31st March ...	1898	..15,938,040	16,485,310
30th June ...	,,	..16,143,040	15,617,490
30th September ...	,,	...16,230,540	14,799,860
31st December ..	,,	...16,230,540	14,810,730
31st March ..	1899	..16,275,240	14,807,665
30th June ...	,,	...16,580,240	15,155,345
30th September ..	,,	...16,841,240	16,180,790
31st December ...	,,	...16,621,240	16,600,585
31st March ...	1900	..16,621,240	15,853,831
30th June ...	,,	...16,621,240	15,514,993
30th September ...	,,	...16,621,240	15,677,132
31st December ...	,,	..16,621,240	15,425,635
31st March ...	1901	...16,646,240	14,862,204
30th June ...	,,	...16,219,240	14,233,205
30th September ..	,,	...15,921,240	13,507,235
31st December ...	,,	..15,921,240	13,774,043
31st March ..	1902	..15,951,240	13,112,430
30th June ...	,,	...15,955,240	12,975,880

COMMERCIAL COMPANIES.

Appreciation and Depreciation since 31st December, 1897.

		Face Value of Shares. R.	Market Value of Shares. R.
31st December ...	1897	... 3,911,760	5,086,775
31st December ..	1898	... 3,911,760	4,329,390
31st March ...	1899	.. 3,502,560	4,543,295
30th June ...	,,	... 3,502,560	4,948,092
30th September ..	,,	... 3,603,060	4,618,055
31st December ..	,,	... 3,408,060	4,589,395
31st March ..	1900	... 3,408,060	4,429,670
30th June ...	,,	.. 3,408,060	4,419,635
30th September ...	,,	... 3,408,060	4,678,445
31st December ...	,,	... 3,480,060	4,567,795
31st March ..	1901	... 3,179,560	4,668,835
30th June ...	,,	... 3,179,560	4,588,910
30th September ..	,,	... 3,179,560	4,663,810
31st December ...	,,	.. 3,179,560	4,749,210
31st March ..	1902	... 4,051,020	5,630,400
30th June ...	,,	.. 4,051,020	5,678,610

CEYLON COCOA IN GERMANY.

A HINT FROM MR. RENTON.

Ceylon cocoa growers will feel grateful for the keen interest displayed in their interests by Mr. Renton. Today through the courtesy of Mr. Philip we are enabled to publish a hint which Mr. Renton sends to cocoa growers in Ceylon and which is specially applicable to those who export their produce to Germany. A valued correspondent with considerable knowledge of the subject gives us the following information of interest:—"The washing of cocoa and consequent removal of mucilage is pretty general in Ceylon, though there are, I understand, two or three estates where cocoa is not washed and mucilage is allowed to dry on the bean. I sent a sample of cocoa home some weeks ago, with mucilage dried on. Brokers reported "dark stained skin, good brownish *break*, well fermented and of even colour. The dark stain on skin would prevent its sale on type. Bright fiery skin is preferred, and, if this can be obtained, couple with 'break' same as sample, a fancy price might be secured." I do not suppose it is possible to get the bright appearance when the slimy mucilage is dried on the bean. Of course, if buyers generally began to realise that the "break" of the dark-skinned beans was always better, the fiery skin would cease to attract. Fiery skin has hitherto, I expect, generally indicated probable good "break." Enclosed are 2 samples: A, washed, B, unwashed. The latter has suffered in the keeping somewhat but not a great deal." (To the unpractised eye at any rate the washed beans look the most attractive.) What Germany wants, it is evident from the above, is not wanted at home. It would be interesting, however, and would save others experimenting, if some of those who export "unwashed" cocoa would give their opinion on the extract sent by Mr. Renton.

THE CEYLON, JUNGLE-FOWL.

Gallus lafayettii, Blanford, Faun. Brit. India Birds, Vol. IV.

Native names:—*Weli kukula* (the male) *Welikikil* (the female) Cingalese, *katu koli*, Tamils of Ceylon.

The cock of this species bears a strong general resemblance to the red jungle-cock, but is orange red below as well as above, the breast feathers being glossy and pointed—very like hackles, in fact. The secondary quills of the wing are also purple black instead of chestnut. The throat and most of the rump-feathers, which are not so long and hackled as in the continental bird, are glossy violet, and the tail has a purple rather than a green gloss. The comb also in this species has a yellow patch in the middle; the face and wattles are darker, and the legs are yellow instead of slate colour. The hen is quite as different in her way from the red jungle-fowl hen; she is of much the same partridge-brown hue above but has no distinct hackle on the neck; her wings are boldly barred with black, and her underparts not cinnamon but mottled black, brown and white, becoming lighter further back. Her legs are yellow like the cock's. She has no wattles, and is feathered on the face. Young cocks are redder above and darker below than hens. The size of this species is about the same as that of the red jungle-fowl, except that the cock's tail is longer; the hens, on the other hand, appear to be shorter in the species.

The Ceylon Jungle-fowl is confined to the island "where every prospect pleases"; but the parts thereof that especially gratify the tastes of the bird are the northern jungle and the southern hills. There seems to be a good deal of variation in the breeding season and also in the number of eggs laid, which is given as from two to twelve by different authors. There is nothing noteworthy about the appearance of these eggs. The crow of the Ceylon cock is very different from that of the rival chanticleer of India, being two-syllabled and commonly rendered as a call to one "George Joyce." A Ceylon planter, however, told me recently that the general opinion now-a-days was that the bird's friend's name was "John." The cock is a gentleman of somewhat Don Juan-like instincts and apt to intrude on the domestic happiness of village roosters, without the excuse that the red junglefowl can offer of community of descent. But there is as yet no proof that the offsprings of these *mesalliances* is fertile, much as the present species resembles the Indian ancestor of the domestic fowl.—"The Indian Forester," July.

RUBBER CULTIVATION IN CEYLON: CASTILLOA (AND PARA): VALUABLE RESULTS FOR THE FORMER IN MATALE DISTRICT.

We are well-pleased to stand corrected in the following letter from Major Gordon Reeves, which affords such practical and valuable information as we feel sure must lead to a new departure in regard to rubber cultivation in the drier districts not suitable for "Para" which can only be grown in a limited area in Ceylon. Undoubtedly we were wrong in saying in general terms that "Para" was the safer species to plant. Our warning should rather have been to take care about imported seed or plants of Castilloa being of the right kind. But let Major Reeves give his experience:—"I read your leading article on rubber in a recent issue with interest, but I am at issue with you when you state generally that Para is the kind to cultivate. The cultivation of rubber must, I imagine, be governed by climatical conditions. Para rubber will flourish in a moist climate even in marshy land, where Castilloa and Ceara would refuse to grow at all. Because there may be even a dozen species of Castilloa that are practically worthless, is that any reason why the species that is really valuable should be rejected by those owning land suitable for its cultivation? Planters were wise enough in their generation not to base their action on that argument, in the case of cinchona.

"The good species of Castilloa are doubtless as well-known and distinguished as those of the cinchona. My own experience is most decidedly in favour of Castilloa as against Para in such districts as Matale. Experiments carefully carried out at Wiharegama by Mr. G. H. Gibson, extending over *six months* proved that a yield of 1½ lb. of rubber, valued

in Liverpool by Messrs. W. Wright & Co. at from 2s 11d to 3s $6\frac{1}{2}$d per lb., could be secured off trees with a diameter of from 10 to 12 inches.

"I will refer to the subject of growth later. In the meantime it should be noted that the above experiments were carried out in the absence of any scientific knowledge of the principle of tapping and curing as at present obtain, and that the rubber was partly sun-dried. Messrs. Wright & Co. remark: 'We think the rubber, if equal to the samples, would meet a steady sale in the market; No. 1 is very like good scrappy Negro Head (Para) No. 2 like Peruvian Slab.'

"In a recent issue of your paper, an extract appeared in which Mr. Morris speaks very highly on the yield of Castilloa and Mr. Morris is a man whose testimony cannot be lightly rejected. The general opinion went to show that an average yield of about 2 lb. of rubber per tree per acre could be expected, although instances of a very much greater yield were proved. You will note that the Wiharegama experiments support these views for, although they extended over six months only, it is probable that during the drier season, January to July, the quantity yielded would be comparatively small. We shall, however, have further evidence to present on the subject.

"As regards growth here again in the Matale Valley, as in yield, the Castilloa has the advantage over the Para rubber. 8-year-old trees at Wiharegama, planted under cacao and dadaps, show a height of about 30 to 40 feet with girth of 30 to 36 inches. The statement below which has been furnished by Mr. B. H. Jenkyns as regards the growth of Castilloa on our new clearings at Ambanganga, North Matale, where the Cacao and Castilloa have been put out simultaneously, seems to show that the older trees in Wiharegama have been at a disadvantage in being put out under established Cacao:—

No.	Height Ft.	Height In.	Girth In.		No.	Height Ft.	Height In.	Girth In.
1	12		17	...	6	12	2	16
2	14		18	...	7	13	1	17
3	13		17	...	8	12	3	13
4	11	7	19	...	9	12	1	18
5	13	4	18	...	10	12	2	18

—girths measured at 1 foot above ground level. The trees from which the above measurements are taken are just over 2 years old, and although they have come through a prolonged and trying drought show no sign of distress. The advantage of the Castilloa in dry climates over the Para tree lies chiefly in cost of production, the flow of latex at all times being much freer. I make this statement without prejudice, inasmuch as the Para rubber has so far a large representation, and I should be only too pleased to record of it equally good results. At the present time the price of rubber allows a profit, even a handsome profit, along with a very heavy cost of production, but most of us have to look forward some 6 to 8 years. When that period has passed the man who possesses the species of rubber yielder suited to his climate and soil will undoubtedly score. *Note.*—According to Messrs. W. Wright & Co. the difference in value between our unscientifically-cured Castilloa. No. 1 sample, and *fine Para* was $6\frac{1}{2}$d per lb."

TEA PLANTING IN NATAL.

Tea planting in Natal is in an exceedingly prosperous condition, according to Reuter's. Upon Messrs. W R Hindson and Co's estates, the second in importance in Natal, there is an aggregate of about 800 acres under tea of all ages. The output in 1901 was given as 400,000 lb, and this year it is hoped it will be increased by 50 per cent. Wholesale prices obtained by Natal tea estates upon the South African market run from 7d and $7\frac{1}{2}$d per pound for the lowest quality to 1s $6\frac{1}{2}$d per pound for the highest quality.—*Daily Mail*, June 28.

PRICE RANGES OF CEYLON COCONUT OIL.

The subjoined table shows the highest and lowest price quoted for Ceylon coconut oil in the New York market each month during the past five years, and also the highest and lowest points touched each year. The figures are based on the closing quotations of each successive week:—

CEYLON COCONUT OIL.

	1901. H.	1901. L.	1900. H.	1900. L.	1899. H.	1899. L.
January	$5\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{7}{8}$	$5\frac{3}{4}$	$6\frac{1}{8}$	$5\frac{3}{4}$
February	5.65	5.60	$5\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{3}{4}$	$5\frac{3}{4}$
March	5.60	$5\frac{1}{2}$	$5\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{3}{4}$	$5\frac{3}{4}$
April	$5\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$
May	6	$5\frac{5}{8}$	$5\frac{3}{4}$	$5\frac{3}{4}$	6	$5\frac{3}{4}$
June	6	$5\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{5}{8}$	$5\frac{7}{8}$	$5\frac{3}{4}$
July	6	$5\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{5}{8}$	$5\frac{7}{8}$	$5\frac{1}{2}$
August	6	$5\frac{3}{4}$	$5\frac{7}{8}$	$5\frac{7}{8}$	$5\frac{1}{2}$	$5\frac{3}{8}$
September	6	$5\frac{7}{8}$	$5\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{5}{8}$	$5\frac{1}{2}$
October	7	$6\frac{5}{8}$	$5\frac{3}{4}$	$5\frac{5}{8}$	6	$5\frac{5}{8}$
November	$7\frac{1}{4}$	$6\frac{5}{8}$	6	$5\frac{3}{4}$	$6\frac{1}{2}$	6
December	$7\frac{7}{8}$	$7\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{3}{4}$	$6\frac{1}{4}$	6
Year	$7\frac{7}{8}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{3}{8}$

		1898. H.	1898. L.	1897. H.	1897. L.
January	..	$4\frac{7}{8}$	$4\frac{7}{8}$	5	$5\frac{1}{8}$
February	..	5	$4\frac{7}{8}$	$5\frac{1}{8}$	5
March	...	5	$4\frac{7}{8}$	$5\frac{1}{8}$	5
April	..	$5\frac{1}{2}$	$4\frac{7}{8}$	$5\frac{1}{8}$	5
May	..	$5\frac{1}{2}$	$5\frac{3}{8}$	$5\frac{1}{8}$	$4\frac{5}{8}$
June	..	$5\frac{3}{8}$	$5\frac{3}{8}$	5	4.95
July	..	$5\frac{1}{4}$	$5\frac{1}{8}$	6	5
August	..	$5\frac{1}{4}$	$5\frac{1}{8}$	$5\frac{1}{4}$	$4\frac{3}{4}$
September	..	$5\frac{3}{8}$	$5\frac{1}{4}$	$5\frac{1}{4}$	5
October	..	$5\frac{1}{2}$	$5\frac{3}{8}$	$5\frac{1}{8}$	5
November	..	6	$5\frac{3}{4}$	$5\frac{1}{8}$	5
December	..	$6\frac{1}{4}$	$6\frac{1}{8}$	5	$4\frac{7}{8}$
Year	..	$6\frac{1}{4}$	$4\frac{7}{8}$	6	$4\frac{5}{8}$

—*Oil, Paint and Druger Reporter*, June 16.

INDIA-RUBBER INDUSTRY.

PERU—BOLIVIA.

H.M Consul-General at Callao also remarks that the india-rubber industry is likely to progress, as, from all accounts, the forests of Peru contain innumerable rubber trees. From 1st July, 1900, to 30th July, 1901, grants amounting in the aggregate to 1,240,000 acres of forest land, said to contain valuable rubber trees, have been made by the Government. These lands lie in the Departments of Huanuco and Cuzco. The periods of the grants are either five or ten years. The royalty claimed by

the Government is 2s for every quintal of rubber which is exported. During the same period six other concessions were granted under somewhat different conditions. One of the grants comprised 4,942 acres and the others 1,235 acres each. These grants are divided into plots called "estradas." Each "estrada" contains within its boundaries 150 rubber trees. The royalties levied in this case are 20 cents annually for each "estrada" and 20 cents for each hectare of land which the estradas cover. Here it may be mentioned that vast tracts of land, known as the Acre or Aquiry territory, forming the hinterland to Peru from the 7 deg. to 12 deg. of south latitude, have quite recently been made over by Bolivia to a syndicate. The syndicate have been granted extensive powers, such as the right to administer the territories in question and to organise an armed force. However, their chief object appears to be the extraction of rubber. The territories thus placed in possession of the syndicate are vaguely described as being bounded on the north-east by Brazil, on the west by Peru, and on the south by the River Abuna and a line drawn from that river to the confluence of the Inambari with the Madre de Dios. Matters are so far advanced that a scientific commission sent out by the syndicate is already engaged in exploring a portion of that district.—*Foreign Office, Annual Series.*

CEYLON GREEN TEAS GRANT, 1901-1902.

Memo showing number of lb. on which payment was made monthly during 1901 and 1902 respectively.

FOR THE YEAR 1902

January	152,873 lb
February	139,124 do
March	170,050 do
April	284,137 do
May	293,671 do
June	368,536 do
	1,414,391 lb

TO SAME DATE 1901 AS UNDER.

January ...	252,582 lb
February ...	116,592 do
March ...	105,644 do
April ...	70,614 do
May ...	24,438 do
June ...	40,017 do
	609,887 lb—804,504 increase

JULY-DECEMBER 1901 AS UNDER.

July ..	163,967 lb
August ..	177,079 do
September ..	112,244 do
October ...	205,137 do
November ...	117,275 do
December ..	136,411 do
	912,113 lb

NOTE.—In July 1901, 71 lb was added for a further claim making the total for six months 912,113 and not 912,042 lb as per previous statement.

A. PHILIP.

Kandy, 1st July, 1902.

THE TEA TAX AND THE TEA TRADE

NEW MARKETS AND GREEN TEAS.

The story of the tea trade for the past season is not a very hopeful one on which to base optimistic forecasts of the future, and it is not surprising to find that Messrs. W J & H Thompson, in their annual review, have not been able to pump up over much enthusiasm over the outlook. We would gladly see the tax on tea removed if it were possible, but it seems a very poor policy to suggest that, because one industry is suffering from the oppression of a tax, others should be similarly burdened ; and they fail in the first place, to prove that the tea trade is oppressed in this manner, probably because they do not really feel sure themselves that such is the case. These gentlemen assert that the theory that the tax is paid wholly by consumers has broken down under the practical experience of those engaged in trade; that every grower abroad, every shareholder at home, pays part of the sixpence levied here; shippers of China and Japan teas have suffered from the 10 cents war tax in the United States, and traders all the world over are hampered by duties almost everywhere imposed, and to this they attribute the lower prices obtained. But, if the producer pays the tax, how is the following statement to be explained? Opponents to this pet theory of the Protectionist, we are told, seem hardly to realise that when more of the buyers' capital is taken for payment of tax, less of it remains for purchase of tea, an argument which would appear to demolish the previous one entirely. The truth of the matter is that, although planters have now realised the folly of the reckless extension indulged in in the past, and are endeavouring to counteract the evil results as much as possible by restricting their outturn, that outturn is still too large to be absorbed through existing channels, and the inexorable law of supply and demand is the sole cause of the present depression. As for the finding of new outlets, little progress has been made in the United States, chiefly, we believe, because our planters will not accept the suggestions so often made to them and go in for producing green tea instead of black. Indian teas shipped to that market have grown gradually less and less, and although the quantity of Ceylon tea has risen, the gain has not been in proportion to the loss in Indian, and considering the opportunity afforded by the interruption to the China trade, cannot be regarded as at all satisfactory. The outlook for India for the immediate future at least, is disappointing. Once more an Indian industry seems destined to share the fate of so many others that have preceded it—flourishing and full of promise for a time, and then glut or decay.—*Investors' Review*, June 28.

GOLD-MINING ON THE NILGIRIS.

AN APPLICATION TO PROSPECT.

Mr. J C C Herklots, proprietor of Benhope Estate on the Nilgiris, has applied to Government for a gold prospecting license for about 40 acres of land. The application comprises private lands, as well as Government reserved forests, and is over a mile in length and 300 feet in width. The District Officer, to whom the application was referred, considered that any slight derangement of the soil might occasion landslips. Mr C M Mullaly, the Acting Collector of the Nilgiris, considered that the application was of considerable importance for several reasons, viz, (1) Indications existed of a reef running in the block, and the object of the application was to obtain a sufficient length to induce a leading firm, (Messrs Taylor & Co.) to take up the work of prospecting. While duly safegarding other interests, every encouragement should, he thought, be given to *boná fide* prospectors for gold. (2) Safety of the Railway and the two Ghaut roads. (3) Beauty of the landscape and preservation of the forest. The Board of Revenue upheld the Collector's

views and recommended that facilities for prospecting in the tract, which exhibits indications of an auriferous reef, may safely be given by assigning a plot near the Coonoor River and another at the top of the Burliar Valley. The Government has accordingly sanctioned a license being granted to Mr Herklots on the terms proposed by the Board of Revenue.—*M. Mail*, July 15.

TEA IN FORMOSA.

The Osaka *Asahi* publishes an interesting letter from Taipeh, as follows :

Seven years have now elapsed since Formosa was acquired by Japan. The first three or four years were spent in investigations, and it is only recently that practical experiments were made and public works started in earnest. Experiments for the improvement of the tea plants are still being made. The examination of manure was taken in November last. Tea-culture experimental stations are established at Bunsanbo and Tokanbo, under the charge of Mr Fujie, an expert. Last year 1,880 yen was appropriated to this department, and all the arrangements required were completed. This year 3,500 yen has been granted, and the testing of manure has been commenced. People of the island who are interested in tea cultivation say that the plants, given manure, produce more leaves, but they lose the natural flavour of the Formosa tea, so that they are unfit for making the best Oolong variety. If the results of the experiment be as anticipated, the production of tea can be doubled, and as it is intended to use machines for preparing the leaf, the result will be a reduction in the price and in the manufacturing expenses. Formosa tea may compete in price with the tea market of the world. The expenses appropriated to the four agricultural experimental stations in the island amount to 24,259 yen.—*Hongkong* July 16.

PLANTING NOTES.

A Blue Rose—grown by a head gardener named Macdonald, in the United States—has been sent to Kew Gardens. As a rarity it may claim rank with the choicest new orchid, and it is therefore not surprising to learn that on the way over the Atlantic it received the most careful attention, and was protected in a specially-constructed miniature greenhouse—a care which was rewarded by its arrival with blooms in excellent condition. —*B Weekly*, June 26.

Cyprus—is one of the most beautiful and interesting of our possessions, and at one time it was the richest and most luxurious spot of the classical world. It is even yet exceedingly fertile, and possesses, moreover, a fair climate ; but, for all its natural advantages, it seems to be held of little account by the Government, which, however, has recently constructed some excellent roads between the principal towns along the coast, whereby travelling is rendered much easier than it used to be twenty years ago. At present, unfortunately, there is only one decent hotel in the island—that at Larnaca, which, by the way, Mr Haggard says (in "A winter pilgrimage through Palestine, Italy, and Cyprus," just published) is "absurdly cheap," a distinct advantage in these times. Larnaca, where we have our Consulate, might be made the headquarters for an interesting tour of the island, including Famagusta, and the Ruins of Colossi, Amathus, Curium, Nicosia, and Kyrenia.—*Home paper*.

Ensilage.—The Board of Agriculture desire to acquaint persons desirious of making silage that copies of a leaflet containing information on the subject of ensilage may be obtained, post free and free of charge, on application to the Secretary, Board of Agriculture, 4, Whitehall-place, London, S.W. Letters of application so addressed need not be stamped.—London *Times*, June 27.

Brooke Bond & Co.—This famous tea distributing Company's annual meeting will be found reported in on page 121. A dividend of 15 per cent, with 2½ per cent bonus—and another £13,000 to the reserve which is to be brought up to £150,000, the original capital ! —shows how little it has been affected by trade depression. Mr. Hector Forbes, the Chairman, protested against producers having to pay £6,000,000 in duty on a total value of £7,500,000 ; but he had no confidence in any 'reduction of output' scheme.

The Manufacture of Papain.—In the course of a notice on the paper on this subject, which appeared on page 4 of the *Agricultural News*, the *Montserrat Herald* says ;—This article is pretty well exported from here. There are not less than three drying stoves in the island of Mr. Watts' description, so the mode of preparation is not new to those who are engaged in its manufacture. But we do not think that it is generally known by those who sell the juice that "it is essential that no iron knife or iron utensils should be brought into contact with the milk. Wood and bone should be employed, and the milk should be collected in earthenware basins or cups, or in glass vessels, and not in tins which are sure to blacken it."—*W. I. Agricultural News*, June 7.

Synthetic Rubber.—A process for the manufacture of "synthetic rubber" from cotton-seed oil and fibre has been invented by Messrs John Burdon & Company, which should, if it proves to be commercially of the value claimed for it, do much towards cheapening the cost of all manufactures involving the use of rubber in any shape or form. The inventors assert that a mixture containing 25 per cent. of pure rubber produces at a considerably lower cost an article of equal value for almost all commercial purposes, and if this assertion can be made good by the test of actual working there is certainly room for the new industry which will arise. At present the cost of pure rubber is 4s per lb, or £20 per 100 lb, whereas it is estimated that the new discovery can be produced for £6 17s 6d. per 100 lb, including £5 for 25 lb of Para rubber.—*Investors' Review*, June 21.

Vanilla in Tahiti.—The Journal of the Board of Trade for January 23, 1902, reports that the French Government has fixed 1,000 Kilograms [22,046 lb] as the quantity of vanilla produced in French establishments in Oceania (Tahiti and its Dependencies) which during the period from July 1, 1901, to June 30, 1902, is to be allowed a reduction of 50 per cent of the ordinary import duty on importation with France. In 1899 Tahiti exported 130,113 lb of Vanilla. The price realised was very low, only 4s 5½d per lb, owing largely to faulty preparation. The Consular Report on the Trade of the Society Islands for 1899 says that 'Tahiti vanilla properly cured before shipment generally finds a fair market, although it cannot compete in quality with that from Bourbon, Seychelles, Fiji and the West Indies.—*Agricutural News*, May 24.

SHARE LIST.

ISSUED BY THE

COLOMBO SHARE BROKERS' ASSOCIATION.

CEYLON PRODUCE COMPANIES.

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Agra Ouvah Estates Co., Ltd.	500	...	850	850
Ceylon Tea and Coconut Estates	500	..	—	—
Castlereagh Tea Co., Ltd.	100	80	90	—
Ceylon Provincial Estates Co. Ltd.	500	490xD	..	—
Claremont Estates Co., Ltd.	100	—	—	—
Clunes Tea Co., Ltd.	100	...	40	—
Clyde Estates Co., Ltd.	100	—	—	—
Doomoo Tea Co., of Ceylon Ltd.	100	..	65	...
Drayton Estate Co., Ltd.	100	—	..	—
Eila Tea Co., of Ceylon, Ltd.	100	—	25	—
Estates Co of Uva, Ltd.	500	190	205	..
Gangawatte Tea Co., Ltd.	100	—	—	—
Glasgow Estate Co., Ltd.	500	—	—	—
Great Western Tea Co., Ltd.	500	565	—	—
Hapugahalande Tea Estate Co.	200	125	—	—
High Forests Estates Co., Ltd	500	..	500	475
Do part paid	400	—	...	...
Horrekelley Estates Co Ltd	100	70	—	—
Kalutara Co., Ltd.,	500	—	150	125
Kandyan Hills Co., Ltd	100	—	40	—
Kanapediwatte Ltd.	100	—	50	..
Kelani Tea Garden Co., Ltd.	100	..	35	—
Kirklees Estate Co., Ltd.	100	60	—	—
Knavesmire Estates Co., Ltd.	100	42½	45	...
Maha Uva Estates Co., Ltd.	500	—	350	...
Mocha Tea Co., of Ceylon, Ltd.	500	--	775	—
Nahavilla Estate Co., Ltd.	500	..	300	—
Neboda Tea Co., Ltd.	500	—	...	—
Palmerston Tea Co., Ltd.	500	...	400	—
Penrhos Estates Co , Ltd.	100	—	75	—
Pitakanda Tea Company	500	—	...	—
Pine Hill Estate Co., Ltd.	60	...	40	—
Putupaula Tea Co., Ltd.	100	...	..	—
Ratwatte Cocoa Co., Ltd	500	.	—	—
Rayigam Tea Co., Ltd.	100	...	40	—
Roeberry Tea Co., Ltd.	100	—	85	—
Ruanwella Tea Co., Ltd	100	...	30	—
St. Heliers Tea Co., Ltd,	500	...	—	—
Talgaswela Tea Co., Ltd.	100	15	—	—
Do 7 per cent Prefs.	100	..	—	...
Tonacombe Estate Co., Ltd,	500	..	...	250
Union Estate Co., Ltd.	500	...	110	—
Upper Maskeliya Estates Co., Ltd.	500	...	—	—
Uvakellie Tea Co., of Ceylon, Ltd	100	...	—	—
Vogan Tea Co., Ltd.,	100	...	70	—
Wanarajah Tea Co., Ltd.	500	..	900	—
Yataderiya Tea Co., Ltd.	100	—	275	..

CEYLON COMMERCIAL COMPANIES

Company	paid p. sh.	Buyers.	Sellers.	Transactions.
Adam's Peak Hotel Co., Ltd.	100	...	30	...
Bristol Hotel Co., Ltd.	100	105	110	...
Do 7 per cent Debts	100	107	—	..
Ceylon Gen. Steam Navigation Co., Ltd	100	—	...	—
Ceylon Ice & Cold Storage Co. Ltd.	100	—	115	..
Ceylon Superæration Ltd.	100	—	40	—
Colombo Apothecaries' Co. Ltd.	100	—	135	135
Colombo Assembly Rooms Co., Ltd.	20	15	..	—
Do prefs.	20	...	..	—
Colombo Fort Land and Building Co., Ltd.	100	—	82½	...
Colombo Hotels Company	100	...	290	—
Galle Face Hotel Co., Ltd.	100	100	—	—
Kandy Hotels Co., Ltd.	100	..	130	—
Kaluganga Nav. Co. Ltd.	60	...	—	—
Mount Lavinia Hotel Co., Ltd.	500	—	300	—
New Colombo Ice Co., Ltd.	100	..	100	..
Nuwara Eliya Hotels Co., Ltd.	30	—	33	...
Do 7 per cent prefs.	100	—	115	—
Public Hall Co., Ltd.	20	...	—	8·50

LONDON COMPANIES

Company	paid. p. sh.	Buyers.	Sellers.	Transaction.
Alliance Tea Co., of Ceylon, Ltd.	10	..	8—9	..
Anglo-Ceylon General Estates Co	100	...	55—60	—
Associated Estates Co., of Ceylon	10	...	1½—2½	—
Do. 6 per cent prefs	10	...	3—5	—
Ceylon Proprietary Co.	1	.	¼—½	..
Ceylon Tea Plantation Co., Ltd.	10	..	23¼—24	...
Dimbula Valley Co., Ltd.	5	..	5—5½	—
Do prefs	5	—	5—6	...
Eastern Produce & Estates Co. Ltd.	5	...	3¼—3¾	—
Ederapolla Tea Co., Ltd	10	...	6—8	...
Imperial Tea Estates Co., Ltd.	10	...	4 4½	—
Kelani Valley Tea Asscn., Ltd.	5	...	3—5	—
Kintyre Estates Co., Ltd.	10	...	6-8	—
Lanka Plantations Co., Ltd	10	..	4	—
Nahalma Estates Co., Ltd.	1	...	nom	..
New Dimbula Co., Ltd.	1	...	2¾—3	..
Nuwara Eliya Tea Estate Co., Ld.	10	—	9¾	—
Ouvah Coffee Co., Ltd.	10	..	6—7	—
Ragalla Tea Estates Co., Ltd.	10	.	11-13	—
Scottish Ceylon Tea Co., Ltd.	10	...	10—15	—
Spring Valley Tea Co., Ltd.	10	...	2—5	—
Standard Tea Co., Ltd.	6	..	10—12	..
The Shell Transport and Trading Company, Ltd.	1	...	2⅞—3⅛	—
Ukuwella Estates Co., Ltd.	25	—	par	...
Yatiyantota Ceylon Tea Co., Ltd.	10	—	5¼	..
Do. pref. 6 o/o	10	..	9—10	...

BY ORDER OF THE COMMITTEE.

Colombo, Aug 1st, 1902.

* Latest London Prices

RAINFALL RETURN FOR COLOMBO.

(*Supplied by the Surveyor-General.*)

	1897.	1898.	1899.	1900	Av. of 32yrs.	1901	1902
	Inch	Inch	Inch.	Inch.	Inch.	Inch.	Inch
January ..	3·81	2·32	6·98	3·72	3·24	11·91	1·95
February ..	1·68	1·98	2·78	0·63	1·89	3·55	4·57
March ..	3·66	4·21	0·88	3·71	4·75	5·12	6·85
April ..	10·97	22·81	6·66	15·12	11·43	8·71	10·01
May ..	8·30	5·80	17·73	10·63	12·04	6·28	11·89
June ..	10·14	10·94	9·23	7·83	8·35	5·93	9·84
July ..	5·24	6·15	1·11	6·77	4·30	4·52	4·63*
August ..	9·09	0·97	0·62	7·35	3·79	0·46	
September ..	4·58	6·90	1·48	4·00	4·98	3·93	
October ...	4·71	20·60	12·99	9·47	14·26	3·91	
November ..	11·66	17·38	8·58	9·25	12·55	19·84	
December ..	8·89	3·05	4·44	5·20	6·35	1·70	
Total..	82·73	103·11	73·48	83·68	88·03	75·86	49·86

* From 1st to 30th July 4·63 inch, that is up to 9-30 a.m on the 31st July.—ED. *CO.*

CEYLON TEA: MONTHLY SHIPMENTS TO UNITED KINGDOM AND ESTIMATE.

Estimate for July 1902—9½ to 10 mil. lb.
Total Shipments Do 1902—10¾ mil. lb.
Do Do Do 1901—8,488,409 lb.
Do Do Do 1900—11,993,600 lb.
[ESTIMATE for Aug. 1902—7 to 7½ million lb.]

THE DEAF HEAR.—No. 479 of *the Illustrated World* of 626, Chiswick High Road, London, W., England contains a description of a remarkable Cure for Deafness and Head Noises which may be carried out at the patient's home, and which is said to be a certain cure. This number will be sent free to any deaf persons sending their address to the Editor.

COLOMBO PRICE CURRENT.

(Furnished by the Chamber of Commerce.)

EXPORTS

Colombo, July 28th, 1902.

CARDAMOMS :—
All round parcel, well bleached per lb. R1·15
Do. dull medium do. R0·95
Special assortment, 0 and 1 only do. R1·30
Seeds do. R1·05

CINCHONA BARK :—
Per unit of Sulphate of Quinine 8c—1½ to 3 per cent.

CINNAMON :—(in bales of 100 lbs. nett.)
Ordinary assortment per lb. 51c.
Nos. 1 and 2 only per lb. 53c,
Nos. 3 and 4 only per lb. 46c.

CINNAMON CHIPS :—(in bgs. of 56 lbs. nett. per candy of 560 lb.) R70·00

COCOA :—
Finest estate red; unpicked per cwt R45·00
Medium do do do R38·00
Bright native unpicked and undried R37·00
Ordinary do do do R28·00
(Local supplies scarce)

COCONUTS—(husked).
Selected per thousand R50·00
Ordinary ,, R42·00
Smalls ,, R37·00

COCONUT CAKE—
Poonac in robins f. o. b. per ton R80·00
Do in bags none.

COCONUT (Desiccated).
Assorted all grades per lb 20c

COCONUT OIL—
Dealers' Oil per cwt R19·00.
Coconut Oil in ordinary packages f. o. b. per ton R415 00.—Sales at higher figure.

COFFEE.—
Plantation Estate Parchment on the spot per bus. None
Plantation Estate Coffee f. o. b. (ready) per cwt.—62·50.
Native Coffee, f.o.b per cwt.—None.

CITRONELLA OIL—
Ready do per lb.—47c Steady.

COPRA—
Boat Copra per candy of 560 lb. R62·00
Calpentyn Copra do do R62·50
Cart do do do R58·00
Estate do do do R62·75

CROTON SEED per cwt—R11·00

EBONY—
Sound per ton at Govt. depot—R180·00.—Next sales fixed for 4th August.
Inferior R90·00.—Next sales fixed for 4th August.

FIBRES—
Coconut Bristle No. 1 per cwt None.
Do ,, 2 None
Do mattress ,, 1 None
Do ,, 2 None
Coir Yarn, Kogalla ,, 1 to 8 15·00
Do Colombo ,, 1 to 8 R11·00.—Fine qualities steady, others lower.
Kitool all sizes None
Palmyrah None

PEPPER—Black per lb None

PLUMBAGO—
Large lumps per ton R650
Ordinary lumps do R625
Chips do R425
Dust do R275 Prices nominal
Fine qualities scarce.
Do (Flying) do R150

SAPANWOOD— per ton R40·00

SATINWOOD (ordinary) per cubic ft. R4·00
Do (Flowered) per cubic ft. R17·00

TEA—	High Grown Average	Medium Average.	Low Grown Average.
Broken Pekoe and Broken	cts	cts	cts
Orange Pekoe per lb	54	42	33
Orange Pekoe do	44	34	31
Pekoe do	39	31	25
Pekoe Souchong do	37	26	23
Pekoe Fannings do	31	28	27
Broken mixed—dust, &c	27	27	26

CEYLON EXPORTS AND DISTRIBUTION FOR SEASONS 1901 AND 1902.

COUNTRIES	Black Tea. 1902 lbs.	Black Tea. 1901 lbs.	Green Tea. 1902 lbs.	Green Tea. 1901 lbs.	Coffee—cwts. Plantation	Coffee—cwts. N'tive	Coffee—cwts. Total	Cocoa cwts.	C'moms lbs.	Cinnamon Bales. lbs.	Cinnamon Chips. lbs.	Coconut Oil. 1902 cwt	Coconut Oil. 1901 cwts	Copra cwts.	Desiccated Coconut lb.	Poonac. cwts.	Coconuts. No.	Plumbago. 1902 cwts	Plumbago. 1901 cwts.
To U K. ..	63292589	63840591	308905	139800	3865	..	3865	20976	222939	206149	123395	110419	119365	9708	4615314	21	7163708	86028	95587
,, Austria ..	21049	26455	..	..	1	..	1	...	...	5600	36400	7321	1178	...	120550	...	5510	...	..
,, Belgium ..	39216	13166	...	..	64	..	64	475	...	65500	100240	1793	2495	12403	110615	48816	78040	6364	9370
,, France ..	118820	181496	...	..	2	...	2	409	448	33200	5792	238	..	53643	14000	...	56020	618	186
,, Germany ..	326813	234526	...	..	23	..	23	3106	84714	337581	344134	4464	903	62340	1007675	44305	520830	38274	26524
,, Holland ...	4434	15489	...	..	...	..	..	..	..	17000	124600	..	..	..	155220	..	..	203	...
,, Italy ..	8695	7711	.	..	...	..	..	32	435	111600	77112	1310	499	...	...	10	11285	..	...
,, Russia ..	7751205	5567489	106135	..	8	...	8	100	448	130	..	60	..	21036	..	..	...	1546	3713
,, Spain ..	3281	...	..	..	...	..	..	..	..	170500	53632	..	..	...	10250	..	...	...	...
,, Sweden ..	39573	26874	...	..	..	..	..	400	...	..	..	617	199	...	..	..	..	263	...
,, Turkey ..	19124	26669	..	.	...	...	..	..	..	..	...	...	...	..	...	...	..	..	...
,, India ...	48224	817097	17331	16124	63	...	63	2	61382	...	2296	41251	54246	...	...	...	19400	1691	192
,, Australia ..	10341036	11850875	..	1714	1772	14	1786	415	...	2924	15208	..	94	...	339561	21	..	156	132
,, America ...	2327057	1183897	394600	405364	820	...	820	...	2326	81000	6275	34827	7007	...	730095	...	...	145285	82333
,, Africa ..	310228	166196	1200	..	6	..	6	..	2226	..	..	60	76	..	17300	1	661481	..	...
,, China ...	2101356	1852356	...	4853	19	..	19	100	5745	6200	112	339	707	..	1918	..	-	797	..
,, Singapore ...	101832	81000	...	...	1	...	1	4717	1900	...	..	71	...	...	...	...	...	...	...
,, Mauritius .	45900	20820	..	...	230	..	230	..	..	..	..	...	..	...	..	..	..	..	..
,, Malta .	207131	213258	..	...	...	...	..	...	..	...	..	..	..	..	...	..	..	...	..
Total export from 1st Jan to 28th July 1902.	87001464	80126065	828471	567855	6874	14	6888	30732	382613	1037384	889196	202770	186769	159131	7122493	93174	8516274	281168	215537

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From Lewis & Peat's Fortnightly Price Current, London, July 16th, 1902.)

	QUALITY.	QUOTATIONS.
ALOES, Soccotrine cwt.	Fair to fine dry ..	70s a 80s
Zanzibar & Hepatic ,,	Common to good ..	20s a 60s
ARROWROOT (Natal) lb.	Fair to fine ..	7d a 8d
BEES' WAX, cwt.		
Zanzibar & Bombay { White ,,	Good to fine	£6 a £7 10s
Yellow ,,	Fair ,,	£6 a £7 5s
Madagascar ,,	Dark to good palish	£6 12s 6d a £7 10s
CAMPHOR, Formosa ,,	Crude and semi-refined	160s a 180s.
Japan ,,	Fair average quality ..	160s
CARDAMOMS, Malabar lb	Clipped, bold, bright, fine	1s 9d a 2s
	Middling, stalky & lean	1s a 1s 7d
Ceylon. Mysore ,,	Fair to fine plump ..	1s a 3s 2d
	Seeds ..	1s 3d a 1s 7d
,, Tellicherry ,,	Good to fine ..	1s 6d a 2s
	Brownish ..	1s 3d a 1s 6d
,, Long ,,	Shelly to good ..	9d a 2s 9d
,, Mangalore ,,	Med brown to good bold	2s 3d a 3s 3d
CASTOR OIL, Calcutta ,,	1sts and 2nds ..	2⅝d a 2⅞d
CHILLIES, Zanzibar cwt.	Dull to fine bright ...	32s 6d a 40s
CINCHONA BARK.— lb.	Ledgeriana Orig. Stem	6d a 9d
Ceylon	Crown, Renewed	5d a 7d
	Org. Stem	3½d a 7d
	Red Org. Stem	3⅜d a 4¼d
	Renewed	3d a 5¾d
	Root	3¾d a 4d
CINNAMON, Ceylon 1sts	Ordinary to fine quill	8½d a 1s 6d
per lb. 2nds	,, ,,	8d a 1s 6d
3rds	,, ,,	7½d a 1s 4d
4ths	,, ,,	7d a 11d
Chips	,, ,,	2½d a 10d
CLOVES, Penang lb.	Dull to fine bright bold	5½d a 1s
Amboyna ..	Dull to fine	4½d a 6d
Zanzibar }	Good and fine bright	3 13-16d a 4¼d
and Pemba }	Common dull to fair	3⅜d a 3¾d
Stems ..	Fair	1d
COFFEE		
Ceylon Plantation ,,	Bold to fine bold colory	92s 6d a 120s
	Middling to fine mid ...	80s a 106s
	Smalls	40s a 60s
Native	Good ordinary	40s a 55s
Liberian ,,	Small to bold	30s a 40s
COCOA, Ceylon ,,	Bold to fine bold	66s a 80s
	Medium and fair	58s a 65s
	Native	49s a 60s
COLOMBO ROOT ,,	Middling to good	8s a 13s
COIR ROPE, Ceylon ton		nominal
Cochin ,,	Ordinary to fair ..	£13 10s a £18
FIBRE, Brush ,	Ord. to fine long straight	£16 a £19
Cochin ,,	Ordinary to good clean	£20 a £24
Stuffing ,,	Common to fine	£7 a £9
COIR YARN, Ceylon ,,	Common to superior	£15 a £30
Cochin ,,	,, ,, very fine	£12 a £32
do. ,,	Roping, fair to good	£10 a £14 10s
CROTON SEEDS, sift. cwt.	Dull to fair	15s a 25s
CUTCH ,, ,,	Fair to fine dry	23s a 35s
GINGER, Bengal, rough ,,	Fair	40s
Calicut, Cut A ,,	Good to fine bold	80s a 90s
B & C ,,	Small and medium	48s a 70s
Cochin Rough ,,	Common to fine bold	37s a 41s
	Small and D's	35s a 38s
Japan ,,	Unsplit	32s a 34s
GUM AMMONIACUM ,,	Sm. blocky to fine clean	10s a 35s
ANIMI, Zanzibar ,,	Picked fine pale in sorts	£10 7s 6d a £18
	Part yellow and mixed	£7 a £9
	Bean and Pea size ditto	70s a £9 2s 6d
	Amber and dk. red bold	£5 15s a £8
	Med. & bold glassy sorts	90s a £7 17s 6d
Madagascar ,,	Fair to good palish ...	£4 a £8
	,, ,, red ...	£4 5s a £7 10s
ARABIC E. I. & Aden ,,	Ordinary to good pale	25s a 40s
Turkey sorts ,,		30s a 37s 6d
Ghatti ,,	Pickings to fine pale ...	10s a 21s
Kurrachee ,,	Good and fine pale ...	27s 6d a 30s
	Reddish to pale selected	10s a 25s
Madras ,,	Dark to fine pale ..	18s a 25s
ASSAFŒTIDA ,,	Clean fr. to gd. almonds	45s a 75s
	Ord. stony and blocky	9s a 30s
KINO ,,	Fine bright	6d a 8d
MYRRH, picked ,,	Fair to fine pale	75s a 120s
Aden sorts ,,	Middling to good	50s a 70s
OLIBANUM, drop ,,	Good to fine white	42s a 50s
	Middling to fair	28s a 42s 6d
pickings ,,	Low to good pale	20s a 26s 6d
siftings ,,	Slightly foul to fine	18s a 23s
INDIARUBBER, Ceylon ,,	Fine (grwn. fr. Para seed)	2s 3d a 3s 6¾d
Assam	Good to fine	2s a 2s 3d
	Common to foul & mxd.	7d a 1s 6d
Rangoon	Fair to good clean ...	2s a 2s 4d
Borneo	Common to fine	6d a 2s 2d

	QUALITY.	QUOTATIONS.
INDIARUBBER *(Contd.)*		
Java, Sing. & Penang lb.	Foul to good clean ...	8d a 2s 1d
Mozambique ,,	Good to fine Ball ...	2s 6d a 2s 9d
	Ordinary to fair Ball ...	1s 10d a 2s 2d
	Low sandy Ball ...	9d a 1s 6d
	Sausage, fair to good ..	1s 10d a 2s 4d
	Liver and Livery Ball ..	1s 9d a 2s 2d
Nyass aand	Fair to fine ball ..	2s 3d a 2s 6¾d
Madagascar	Fr to fine pinky & white	2s a 2s [illegible]d
	Fair to good black ..	1s [illegible]d a 1s 9d
	Niggers, low to fine ..	7d a 1s 9d
INDIGO, E.I.	Bengal—	
	Shipping mid to gd violet	3s 5d a 3s 9d
	Consuming mid. to gd.	2s 11d a 3s 3d
	Ordinary to mid.	2s 6d a 2s 10d
	Mid. to good Kurpah	1s 6d a 2s
	Low to ordinary	9d a 1s 3d
	Mid. to good Madras	1s 4d a 1s 10d
MACE, Bombay & Penang	Pale reddish to fine	2s a 3s
per lb.	Ordinary to fair	1s 4d a 1s 11d
	Pickings	1s 3d a 1s 4d
MYRABOLANS, } cwt	Dark to fine pale UG	5s a 6s
Madras }	Fair Coast	4s 6d a 5s
Bombay ,,	Jubblepore	4s 6d a 5s 6d
	Bhimlies	4s a 6s
	Rhajpore, &c.	3s 6d a 5s 6d
Bengal ,,	Calcutta	3s 6d a 5s
NUTMEGS— lb.	64's to 57's	2s 6d
Bombay & Penang ,,	110's to 65's	1s 1d a 2s 5½d
	160's to 115's	6d a 1s
NUTS, ARECA cwt.	Ordinary to fair fresh	14s a 18s
NUX VOMICA, Bombay	Ordinary to middling	5s 6d a 6s
per cwt. Madras	Fair to good bold fresh	7s a 10s
	Small ordinary and fair	5s a 6s 9d
OIL OF ANISEED ,,	Fair merchantable	4s 2d
CASSIA ,,	According to analysis	2s 1d a 2s 6d
LEMONGRASS ,,	Good flavour & colour	5d
NUTMEG ,,	Dingy to white	1⅓d a 2½d
CINNAMON ,,	Ordinary to fair sweet	3¼d a 1s 3d
CITRONELLE ,,	Bright & good flavour	9½d a 10d
ORCHELLA WEED—cwt		
Ceylon ,,	Mid. to fine not woody..	10s a 12s 6d
Zanzibar. ,,	Picked clean flat leaf ...	10s a 14s
	,, wiry Mozambique	10s a 11s
PEPPER—(Black) lb.		
Alleppee & Tellicherry	Fair to bold heavy ...	5¼d a 5½d
Singapore ...	Fair	5 9-16d
Acheen & W. C. Penang	Dull to fine	4¾d a 5¼d
PLUMBAGO, lump cwt.	Fair to fine bright bold	30s a 35s
	Middling to good small	20s a 28s
chips	Dull to fine bright ..	9s a 15s
dust	Ordinary to fine bright	4s a 7s 6d
SAFFLOWER	Good to fine pinky .	65s a 75s
	Inferior to fair .	40s a 60s
SANDAL WOOD—		
Bombay, Logs ton.	Fair to fine flavour ..	£15 a £30
Chips ,,	... ...	£5 a £8
Madras, Logs ,,	Fair to good flavour ..	£15 a £30
Chips ,,	Inferior to fine ...	£4 a £8
SAPANWOOD Ceylon ,,	Fair to good ..	£5 a £5 10s
Manila ,,	{ Rough & rooty to good	£4 10s a £5 15s
Siam ,,	{ bold smooth...	£7
SEEDLAC cwt.	Ord. dusty to gd. soluble	115s a 120s
SENNA, Tinnevelly lb.	Good to fine bold green	5d a 8d
	Fair greenish	3½d a 4d
	Common dark and small	½d a 3d
SHELLS, M. o'PEARL—		
Bombay cwt.	Bold and A's }	
	D's and B's }	48s a 120s
	Small ... }	
Mergui ,,	Small to bold ..	£7 15s a £9 15s
Mussel ,,	Small to bold ...	17s a 55s
TAMARINDS, Calcutta...	Mid. to fine bl'k not stony	8s a 10s
per cwt. Madras	Stony and inferior ..	4s 6d a 6s
TORTOISESHELL—		
Zanzibar & Bombay lb.	Small to bold dark mottle part heavy	17s a 22s
TURMERIC, Bengal cwt.	Fair ...	14s a 16s
Madras ,,	Finger fair to fine bold bright	10s a 14s
Do. ,,	Bulbs ..	10s a 12s
Cochin ,,	Finger ..	10s a 1[illegible]s
	Bulbs ..	9s a 9 6d
VANILLOES— lb.		
Mauritius .. } 1sts	Gd. crysallized 3½ a 9 in	6s 6d a 22s 6d
Bourbon ... } 2nds	Foxy & reddish 3½ a 8 ,,	5s a 15s
Seychelles 3rds	Lean and inferior ...	3s a 7s 9d
VERMILION lb.	Fine, pure, bright ...	2s 1d a 3s [illegible]d
WAX, Japan, squares cwt	Good white hard ...	43s 6d a 45s

THE

AGRICULTURAL MAGAZINE,

COLOMBO.

Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for August :—

Vol. XIV.] AUGUST, 1902. [No. 2.

KEPPETIYA AND BETEL.

MR. George Weerakoon, Mudaliyar of Wellabodde Pattu, writes :—"All vegetable substances are no doubt useful for manurial purposes, but some Ceylon plants are more greatly favoured than others for fertilising the soil. One of these is Keppetiya. As you know, it is a favourite manure, and almost the only fertiliser used for Betel and Chillies. It is also used in paddy-fields, and I have tried it myself with very good results. I have no doubt if examined by the Chemist it will be found to prove its reputation as a manure.

Speaking of betel, it is as your are aware, a *sine qua non* with the villager—almost a part of his diet, so to speak,—though not much in vogue as a masticatory among the anglicised portion of the Sinhalese community. As for myself, though I do not indulge in betel chewing, I see no harm in countenancing the habit which, in my opinion, is to be preferred as less objectionable and deleterious than the "fragrant weed" of Ceylon, provided it is done at the proper time and place without offending the eye. Apart from the regular cultivation of betel in "kottuwas," there is hardly a plot of ground near a dwelling-house that has not got its casual betel vine. As a cultivated product it is decidedly remunerative, and enormous quantities of leaves are sent to upcountry stations, such as Nawalapitiya, by rail. The betel, according to the Sages, has such extraordinary virtues that it is in demand even in the abode of the gods!"

Keppetiya (*Croton lacciferus*) apart from its value for manurial purposes and as a medicinal agent, is a source of lac, as its name implies. Trimen in his Flora, referring to the plant, says :—A small red coccid occurs on the bark of the older trees, and is collected in districts where it is abundant to mix with the colours used in lacquer work. This lac is collected in the dry season near Matale for the Kandyans lacquer industry. It is melted in a metal pot over the fire and is then called Keppitiya resin.

As regards betel (*Piper betle*) we agree with our correspondent that the practise of chewing is "in loco" by no means objectionable or deleterious, and is even to be encouraged among those who have a *penchant* for the habit; for when mixed with the usual concommitants it is undoubtedly useful as a digestive, corrective, and (for the teeth) as a preservative agent. The leaf contains an invaluable oil, which is employed with great success in many ways. In this connection we doubt not our readers, including our correspondent, will be interested and perhaps also amused, by an account of betel-cultivation in India which we give on another page.

OCCASIONAL NOTES.

Since the issue of our last number a great event has been prevented by the stern decree of Nature, under circumstances solemn and almost tragic. We refer to the enforced postponement of the Coronation of King Edward VII, which was to have taken place at Westminster on the 26th June, 1902, owing to the sudden and serious illness of His Majesty. All present danger to the person of the King has now passed, and before the month is out, the great ceremony will, we doubt not, have been consummated.

On July 22nd Dr. Willey, the Director of the Colombo Museum, visited the School of Agriculture, and spent some time working with Mr. Drieberg in the apiary, where the hives were examined and overhauled, and the bees (*Apis indica*) handled without accident.

Quot homines tot sententiæ. One very successful coconut planter lately stated to us that he would not have any of the sensitive plant (*Mimosa pudica*) on his estate for all the nitrogen it imports into the soil. But he was an æsthete and kept his property almost as clean as the Galle Face *Maidan*. Another planter was an ardent admirer of the "modest mimosa" which had only to be kept down and taken full advantage of. His sole objection to the plant was that it made things a bit inconvenient when the plucking

and gathering of the nuts had to be done, but he would sooner supply the pluckers with protection for their feet than go without "nidikumba."

The Florida velvet bean is credited with containing a deleterious principle which is said to be the cause of colic in consumers of this prolific legume, and many people have given the vegetable a wide berth in making up their daily bill of fare. The truth is that the velvet bean requires rather more careful preparation than most vegetables, though even the ubiquitous potato demands some care to make it as wholesome a food as it is. The manioc—at least one variety of it—has to be very well cooked to rid it of the volatile poison (no other than the deadly prussic acid) with which it is associated. A reliable authority informs us that there is now quite a run on Florida beans for vegetable curry, and that the natives have overcome their prejudice against the vegetable by discovering that the beans when first boiled in water with turmeric and salt, lose any noxious properties they may possess. To prepare the curry the whole beans (with of course the hairs all rubbed off) are, after boiling in the way referred to, fried with onions, &c., and then mixed with the ordinary curry ingredients. If any bean is worthy of being called the "poor man's vegetable" we think it is this hardy and prolific legume, and we are glad to hear that its use is likely to extend. We shall be glad to supply seeds on application.

In our June issue we speculated as to what tree could be traced the peculiar odour of chlorine. We have now found a tree, the wood of which when freshly cut emits a decided and strong odour of iodine or iodoform.

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF JULY, 1902.

1	Tuesday ...	·06	17	Thursday ..	·10
2	Wednesday ..	·32	18	Friday ...	·06
3	Thursday ...	·45	19	Saturday ..	Nil
4	Friday ...	·12	20	Sunday ...	Nil
5	Saturday ..	·75	21	Monday ...	Nil
6	Sunday ..	·62	22	Tuesday ...	Nil
7	Monday ...	1·36	23	Wednesday	Nil
8	Tuesday ...	Nil	24	Thursday ...	Nil
9	Wednesday ...	Nil	25	Friday ...	·72
10	Thursday ...	Nil	26	Saturday ..	·15
11	Friday ...	·60	27	Sunday ..	Nil
12	Saturday ..	·70	28	Monday ...	Nil
13	Sunday ...	·40	29	Tuesday ...	1·46
14	Monday ..	Nil	30	Wednesday ..	·23
15	Tuesday ..	Nil	31	Thursday ...	·02
16	Wednesday ...	Nil	1	Friday ..	Nil

Total...8·06
Mean...·26

Greatest amount of rainfall registered in 24 hours, on the 29th Tuesday 1902, 1·46 inches.

Recorded by ALEX. PERERA.

PLANT LIFE.

[A SERIES OF SIMPLE LECTURES INTENDED FOR A CLASS OF JUNIOR STUDENTS.]

LECTURE VI.

From what I have already said you will infer that the greater part of the food of plants is got from the soil. We have been considering the nature of the atmosphere and the important element of plant food which it supplied. We might therefore make some enquiry into the nature of soil and its relation to plants. The soil we said is the medium in which the plant grows. Soils differ in texture, that is they may be loose in texture or more or less close or firm. Soils are generally classified according to the proportion of sand, clay, organic and calcareous matter which go to compose them. These substances are familiar enough to you. Now a soil consisting almost entirely of any one of them will, as you must admit, be an unsatisfactory soil for the growth of plants. Good soils consists of a mixture of sand, clay and decayed organic matter with some proportion of lime (carbonate of lime). Experience proves that a soil is best adapted for purposes of cultivation when it contains from

50 to 70	per	cent	Sand
20 ,, 30	,,	,,	Clay
5 ,, 10	,,	,,	Humus
5 ,, 10	,,	,,	Carbonate of Lime.

Such a soil contains enough sand to make it warm and permeable to air and moisture; enough clay to render it tenacious or cohesive and retentive of manures; enough humus to keep it moist and porous and to assist in supplying the nitrogenous food of plants, as well as to keep up the supply of carbonic acid in the soil; and lastly, sufficient lime to meet the requirements of plants and help in the decomposition of organic matter.

The reason why alluvial soils (found near rivers) are so fertile, is the mixed character they possess, having been so mixed by the action of running water. Most soils, however, are not of such a perfect character, and have generally an excess of one or more of the constituents above named.

A pure sandy soil is deficient both in physical and chemical properties. On such a soil plants are unable to get a hold for their roots, they would have little or no moisture supplied to them, and derive nothing in the way of nutriment from it. But as an ingredient of soils sand is of the greatest importance, since it gives them a loose texture so that they are permeable to air, moisture and warmth.

Clay has properties very different to those of sand. A soil of pure clay would be as unsatisfactory as one of pure sand. Such a soil would be too cohesive and impermeable to water, cold and damp, and in dry seasons would bake as hard as a brick, while from a chemical point of view it is of no value as a source of plant food. But as one of the constituents of soil clay is of the greatest value, absorbing gases from the atmosphere, keeping a soil moist and cool, giving tenacity to it, and retaining useful plant food which would otherwise be washed out of the soil.

But there are always associated with sand and clay (or, to use their scientific names. silica and hydrated silicate of alumina) certain impurities which are of the utmost importance, and it is to these impurities, viz., potassium magnesium, calcium, iron, &c., derived from the original rocks from which the soils were formed) that the plant must look for its mineral food.

Sand and clay are the ingredients which form the bulk of soils. Lime or limestone is useful as supplying an element of plant food, but it also aids in the decomposition of organic matter, and thus helps to prepare the nitrogenous food of plants. Limestone generally contains as impurities phosphates or sulphate of lime, magnesia, &c., which are valuable as plant food, while it also has the effect of keeping soils in a friable (*i.e.*, in an easily worked) condition. Humus or decayed organic matter is very important from a chemical point of view. As a mechanical agent it keeps soil open which would otherwise be stiff and gives body to light soils, while it is also an absorber and retainer of moisture. The ultimate products of the decomposition of humus are carbonic acid, ammonia and water, all valuable agents in the nutrition of plants. A soil wholly composed of organic matter is as you well know [an unsatisfactory one for the cultivator.

I have already given you an idea of what a typical soil should be, and it should be the aim of every cultivator to bring his soil as near as possible to this type. Of the four most important ingredients of plant food (the available supply of which is liable to run short) viz., nitrogen, phosphoric acid, potash and lime: nitrogen is at its highest in peaty soils and at its lowest in sandy soils; phosphoric acid is found most in a clay soil and least in a sandy soil; potash is at its highest in clay and lime in calcareous soils, while both are very deficient in sandy soils.

We have to look upon the bulk of soil as the element in which the roots of plants live—as fish live in water—and travel about in search of food and moisture. The actual nutriment is present in comparatively very small proportions, as will be seen from the following statement showing the percentage composition of a loamy soil:—

* Organic matter and loss on heating	5·07
Oxide of Iron	3·63
Alumina	3·51
Carbonate of Lime	1·48
Sulphate of Lime	·34
Magnesia	·42
Potash	·30
Soda	·01
Phosphoric acid	·10
Insoluble Silicates and Sand ...	85·14
	100·00
* Containing Nitrogen ...	·23
Equal to ammonia	·19

THE AGRICULTURAL OUTLOOK IN SOUTH AFRICA.

Mr. W. Willcocks, C.M.G., M.I.C.E., in a report on irrigation in South Africa addressed to H.E. Lord Milner remarks that the permanent developement of the country will depend on irrigation and irrigation alone. The Colony, it is said, has remained strangely stationary, apart from the developement of its gold, diamond and coal mines. Fifty years ago it was a pastoral country importing cereal and dairy produce and even hay from foreign countries; and it is the same to-day. Half a century ago it needed a farm of 5,000 acres to keep a family in decent comfort, and things are not altered since then. This is the picture drawn by the writer of the report. Except in the south-west corner of Cape Colony, we are told, agriculture has scarcely been attempted except on the most primitive lines and on insignificant areas. Farmers trek from the high velt to the low velt and back again with the seasons. And the reason of this want of developement of the agricultural resources of the country is said to lie in the fact that the rainfall of the three colonies, with the exception of the south-west corner, is uncertain and erratic: it is constant and heavy in autumn, which is followed by a severe winter without any moisture in the air. As Mr. Willcocks pithily puts it—when rainfall is wanted it is not there, when it is not wanted it is invariably present! For countries so situated the only possible means of developement lie, he thinks, is storage of water and irrigation. If these countries are ever to develope their immense agricultural wealth, we are told that they must be proclaimed a semi-arid region, and legislation framed accordingly.

Mr. Willcocks goes on to refer to his experience in the Indian and Egyptian Irrigation Departments, and points to the immense benefits derived from irrigation in these countries and in Italy. Referring to the Transvaal he remarks:—There the mineral wealth is extraordinarily great, but it is exhaustible—some say in 50, some in 100 years. It would be a disaster indeed if none of the wealth were devoted to the developement of agriculture. If the companies working the various mines were by decree required to devote a percentage of their gain to the execution of irrigation works, then when the mineral wealth of the county had disappeared, its agricultural resources would have been put on such a solid basis that the country will not have to fall from the height of prosperity to the depth of poverty. "The permanent developement of the agriculture of South Africa will depend on Irrigation and Irrigation alone."

The plea is a strong one, and the prospect it hints at is bright, and we have no doubt that the wise men at the head of the new administration will not lose sight of the possibilities which irrigation can secure for the country.

BETEL CULTIVATION IN INDIA.

In cultivating betel in the Madras Presidency the land is first planted with *Sesbania grandiflora* (Sin, Katurumurunga), and the cuttings of

betel from a two-year old garden are planted between, two to each tree, to which they are tied with plantain fibre when sufficiently grown. There the vines are apparently well supplied with animal manure half-yearly. At the end of the first year the leaves are picked daily for about 16 months in good and well-manured soil. The best monthly yield per acre is put down at 25 bundles (of hundred leaves each) worth Rs. 30, or for the 16 months of the crop Rs. 480.

It would appear that in the N. C. Province betel cultivation is confined to a special class or "brotherhood of old standing," forming an independent section in the village who pay their rent to the landowner through the head of their body. A portion of the village lands is recognised as belonging to this caste, and in this they dig wells, make their gardens, and, being careful and steady cultivators, contribute much to the general prosperity of the neighbourhood.

The cultivation of betel would thus be considered an honourable pursuit over in India; but wonderful to relate there are dangers to be faced, for we read that in the Central Province, tigers fully appreciate the cool and grateful shade afforded by a betel garden in the hot months, and the cultivators on going to work, not unfrequently find one of these animals entangled in the maze of creepers.

But even the Ceylon villager will smile when he is told that in the neighbouring Continent, when the plant is young and delicate, it is sometimes fed with milk which is found to be an "excellent manure." No doubt!

Regarding the "betel brotherhood" we are told they are so industries and so respected, that landholders allow them many privileges. Thus custom has prescribed that no rent is to be demanded during the time the land remains uncultivated. Rent, too, is only paid in the exact quantity of land sown. Though all the members of the caste give their labour towards the construction of the garden, and share in expenses of watering, weeding, watching, &c., yet each individual is the owner of a portion of the garden, the produce of which he himself gathers and disposes of on his own account, and each has an independent interest in the undertaking. In the Central Province the vines are not kept after the second year when the ground is allowed to go fallow for from 2 to 3 years according to the soil. But in Nimar a garden well established is said to yield steadily for 10 or 12 years. Here the shade trees to which the vines are attached consist of *Sesbania Ægyptica* (Tamil, Chittakatti) a tree which shoots up rapidly and affords good shade for 2 or 3 years, while the plantation is surrounded not, as in other parts, with plantains, but with poles of *Eythrina indica* Erabodu) When the Sesbania trees die down, they are replaced by poles of *Boswellia serrata* of which the bark is believed to give a specially favourable hold to the climber. Every year after the leaves have been gathered the creeper is coiled down at the root until only some 3 feet of it are left above the ground; a fresh root is thus struck and the old coil is next year cut away altogether. Except during the rains the crop is steadily irrigated, and at the beginning of each hot season the plant is pruned, manured and freshened up with transported soil. The level of the land thus become raised about 2 feet in the 10 or 12 years.

The above system is said to be preferable to the ordinary method, entailing less labour, less retardation of profit, and with the annual supply of fresh earth should produce as good a yield. It is practically the same method, combined with artificial shade, followed in Bengal and other places where cultivation is extensively carried on.

In many parts the betel plantation is covered on all sides with bamboo and mat work.

We shall have more to say on this subject in subsequent issues.

THE PROPER METHOD OF PLANTING TREES.

In an article on "Planting" by Mr. A. Despeissis, to the Journal of the Department of Agriculture, Western Australia, the writer gives many useful hints on the subject, which we reproduce for the benefit of our readers.

After marking off to ensure straight planting the holes are dug at the required distances. Holes for fruit-trees should be wide enough to admit of the spread of the roots: the wider the better. In heavy and retentive soil the holing should not be deeper than the drained layer of soil, otherwise the hole would act as a basin. Many trees are killed through the roots decaying instead of growing in a healthy condition.

Before digging the holes, and to insure that the tree will occupy the exact spot the stakes were in, a simple contrivance known as the "tree-setter" is of great use. It consists of a light piece of board 1 inch thick, 4 inches wide, and 4 to 5 feet long. Cut a V-shaped notch in the centre and either bore a hole 1½ inches in diameter 3 inches from each end, or instead of the holes cut notches at each end of the board.

To use the tree-setter, the V-shaped notch is put against the stake which marks the spot the tree is to occupy. Through the hole at each end or in the notches, drive into the ground pegs 1 to 1½ inches in diameter and 12 to 15 inches long that will easily pass through the holes. This being done, remove the central stake, lift the board over the terminal pegs which are left in the ground and dig the hole. When planting replace the tree-setter over the two pegs, and place the stem so that it will occupy exactly the spot the stake occupied before.

The hole should be three feet square, convex in the centre or of the shape of an inverted saucer. This is done by heaping up some loose surface soil, so that when the tree is planted its base stands a little higher than the roots which spread out evenly round, radiating outwards with a slight dip downwards.

In the case of a hard impenetrable bed it is recommended that the bottom layer in the hole should be shattered by means of cartridges of dynamite or 1½ lb. charges of black blasting powder rammed into holes two inches in diameter bored through the hard pan. By this

means numerous crevices will be formed which will promote the drainage of the land and permit the roots of the plants penetrating and gaining access to the subsoil beneath.

Every tree to be planted should be carefully examined for any indication of root galls, scale insects, borers or fungoid growth, to ensure immunity from which it should be dipped either in warm whale-oil soap suds or in kerosene emulsion for a couple of minutes in the case of insect pests, or in Bordeaux solution in the case of fungoid disease.

Trees that have to be kept till required for planting should be put slantwise into a trench in moist well-drained soil, and loose well-pulverized earth banked up round the roots and every part of the stem. The trees should stand thus till required for planting.

It happens that they are sometimes bark-bound, showing a leathery shrivelled bark. In that case they should be thoroughly drenched first and then covered up with moist loose earth or sand, stem and branches, for a couple of days or so, when, unless, too far gone, they assume their healthy look again.

Before planting in the hole make with a sharp knife a clean cut of any bruised root, and with a few shovelsful of earth raise the bottom of the hole so that the collar is level with the surface of the ground. The tendency hitherto has been to plant trees too deep, with the idea that in dry seasons there may be no lack of moisture. Collar rot, rotting of roots, stunted growth, are all due to this, and to the same cause must be attributed the loss of many fruit trees. Deep planting, insufficient pruning, deficient cultivation, neglect of pests all bring about failure.

In planting note that with heavy soils trees should be planted a trifle shallower than usual and *vice versa*.

In careless planting a deep narrow hole is sunk into the ground, the tree is let down with its roots twisted any how, and covered with soil, or, worst of all, soil with stable manure poured over them. If the ground is at all heavy the roots with difficulty penetrate through the wall of such a hole, the earth packed round the bark will prevent the bulk of the tree expanding, the bark will lose its elasticity and will set tight round the tree which will either die of collar-rot or will always be stunted and live a miserable life.

On the other hand too shallow planting results in the tree being blown down or its roots affected by the heat of the sun which in dry weather will effectually desiccate them.

Between the two extremes lies the right way of setting a tree.

If the weather be dry at the time of planting, it is advisable to pour a bucket of water around the stem to settle the earth well on the roots.

Mulch the ground about the newly-planted trees with a light coating of stable manure or of straw.

Manures are sometimes used at the time of planting for giving a good start to the trees, but avoid putting farmyard manure under the roots of the plants, as it would in many cases attack insects and favour the growth of parasitic moulds that would be injurious to the tree. Whenever farmyard manure is used, it should be in the form of a mulch on the top of the soil as its benefits will then be twofold: the plant food it contains will be washed from the surface down to where the roorts are established, and it will act as a screen to prevent evaporation of moisture and smother weeds round the trees. A couple handfuls of phosphates and potash manures mixed well with the earth round the roots prove of great value.

On freshly-cleared ground it is an excellent plan to spread 6 or 7 lbs. of lime round the stakes marking the places for the trees. This will correct the sourness and stiffness of the soil and induce a healthy growth.

An important operation that now remains to be performed is the cutting back, or shortening in, of the newly-planted tree, which would otherwise be checked in its growth and often perish. No matter how carefully a plant is lifted, many of the fine feeding rootlets are torn and bruised, and the feeding capacity of the tree is no longer in keeping with the amount of shoots it carries, and unless the superabundance of these is cut back and the balance re-established between the feeding and the breathing and evaporating organs of the plant, it will make a miserable struggle for existence and in many cases perish.

THREE CHENA CROPS.

[The following extract is from a lecture by Mr. J. M. Orpen, Administering Agricultural Department at Salisbury, Rhodesia, on "The Diet of Native Labour," published in the *Agricultural Journal* of Cape Colony. The three chena crops referred to are *Andropogon sorghum* (Karal-iringu), *Eleusine coracana* (Kurakkan), and *Penisetum typhoideum* (Kambu).]

Kaffir corn or great millet is known in Science as *Andropogon sorghum*. It is less used in Mashona land than some smaller grains presently to be mentioned. It may be used, as it is used by Kaffirs and Basutos, both boiled whole or after ridding it of the husk by stamping; the meal is generally used boiled as porridge or sometimes in a much thicker tough mass which may be called bread; or it is made into "leting," a fermented non-intoxicant or again into the intoxicating "Kaffir beer." The grain is much grown through a great part of Africa and Asia, and more or less in Europe and America.

There is one other way of making a very light, easily digestible, nourishing food from Kaffir corn which I had better mention. It is the food which the Bosutos always use on long tramps. I have used it myself. They call it "dipabi." To make it, Kaffir corn is parched in a pot highly heated over a strong fire. The grains generally burst open with a jump and turn themselves more or less inside out. Colonists call this "springing," and they call such grain *sprung* grain, *i.e.*, sprung Kaffir corn or sprung mealies. In America it is called "popping

corn." This the Basutos grind with a very little salt; they carry it in small kid-skins on their backs when travelling, or in leather bags on pack animals. It is simply chewed with an occasional sip of water.

In December, 1873, having suddenly received orders to that effect, I called out a little army of about 200 native mounted infantry to co-operate with other forces against Langalibalele. We had it in prospect that, before reaching other food supply, we should have a fortnight's march up and down the highest mountains in South Africa, the Maluti of Basutoland, a then uninhabited part of that country. I ordered all the women in the neighbourhood to prepare "dipabi" that night, and I provided a little salt to grind with some of it, and a little sugar with the rest. It was cheap; the whole expedition of six weeks' duration cost the Government £1 per man, with his food, horse and ammunition. On this "dipabi," and meat killed on the road, and but sparingly used, we marched, generally leading our horses, and walking and running as mounted infantry should, till we got into the inhabited part of the north of Basutoland. The men did excellent marching, and could have done so without the meat. I mention this to show another way of giving variety with the same article of food. I have heard of Basutos marching hundreds of miles on "dipabi" alone, carried on their backs. I have often wished our sometimes stinted soldiers marching near Basutoland could have had it. In any case it gives variety. I am sure there is considerable chemical change in the parched and burst grain, and that analysis would easily show the reason of its nutritiousness.

Rukweza, or Rapoko (known in science as *Eleusine coracana*), is a very small, *hard*, red grain, looking like Kaffir corn, but from a wholly different, low-growing plant. It is said the Mashonas have six varieties of it differently named. I learned from Mr. George Watt, a Government officer stationed in the Indian Museum, Calcutta, whose special duty it is, as Government "reporter," to investigate matters connected with economic products, that this grain and munga (of which presently) are both largely grown and used in India as articles of food, but are supposed to have been introduced from Africa. They are probably the original food grain of Mashona-like tribes of Central Africa, and, like other grain, developed from a grass. I learn also that *Eleusine coracana* is now much grown in Japan, so it is extending its range, and suits a wide range of climate. Under European cultivation "rukweza" grows much later, tillers much better, bears more and develops larger grain than when cultivated by natives. Probably, like maize and "pedigree wheat," it might, by repeated selection and careful cultivation, be bred to have a less flinty and a thinner husk, while its size might be progressively increased. At present its diminutive size and hardness give it an advantage in one respect:—it is impenetrable by weevils. It appears to me the most nitrogenous of farinaceous grains. Natives consider food prepared from it more nutritious and satisfying than that from any other grain. Rice-eating natives from other countries quickly learn to prefer food prepared from "rukweza." It and "munga" can be sown late, after other native grain crops show they will fail from drought, locusts, etc., so they are anti-famine crops. As yet, a disadvantage in these two crops and Kaffir corn is that winnowing them is a slow, laborious, difficult process. They do not lend themselves to present methods of machine-threshing or milling. I propose to submit to the Scientific and Technical Department of the Imperial Institute specimens of these three, in the grain and in the ear and straw, for examination and advice as to the possibility of machinery being adapted or devised for threshing, grinding, husking and other treatment. I propose to place before that very strong and well-equipped Department which has been instituted to aid and advise all parts of the Empire, the following questions:—

(*a*) Have any systematic efforts yet been made to improve these grains, and for the above objects, and, if so, with what results?

(*b*) Is it probable that by careful and continuous selection for a few years with improved cultivation, the hard husk of Kaffir corn, rapoko and "munga" could be reduced to a minimum and the grain enlarged, as has been done with mealies and wheat, and with quicker maturity?

(*c*) Is it probable that by devolpements of machinery, these grains could respectively, in an improved manner, be harvested, cleaned, husked and milled, and this on a commercial scale, and that they could be cooked in a simple way on a large scale?

(*d*) Would it be well to have them analysed to ascertain their relative value in food constituents?

(*e*) How would the desired results best be promoted: by departmental experiments, or by stimulating scientific investigation, cultivation and invention by offers of rewards by Governments or Departments?

My impression is that Agricultural Departments of England, America, India and Africa and other countries, and the Imperial and Smithsonian Institutes, should cause these enquiries and experiments to be made, for individual efforts can effect little, and only slow, improvement.

When I was administering Basutoland some twenty years ago I found that for years early rains had been failing and that the staple crop, Kaffir corn, had not time to grow, so partial famine was produced. I made such enquiries as I could as to quicker maturing varieties of that slow-growing grain, and obtained in consequence, at my own expense, one variety of Kaffir corn from Abyssinia, and "amber cane" from Missouri; but I left, and could not press on the experiments.

What is wanted is to see whether this quick maturing, etc., cannot be accomplished, and whether rapoko and munga may not have serious value as, at least, a supplementary crop to save the situation when rains will not fall in time. These grains appear not only to have come to stay, but to be extending in the world's cultivation, and it would seem worth while to improve them.

It may possibly aid the Institute's department in its enquiries if I mention that I was once shown, and ate, at an isolated American Mission, a very light cake made of rapoko, and advantageously used by a person whose indigestion had been impaired by illness. The rapoko was "sprung," then well ground, and then "bolted" through some fine stuff so as only to leave a fine flour of which the cake was made. I do not mean to suggest that native labourers are to be fed on cakes.

Natives complain, perhaps with some little truth, that all their grain is rendered disagreeable or injurious to them by European methods of grinding. It must be remembered, however, that Basuto and others grind Kaffir corn without husking it, and even eat it boiled whole. At home, as I have said, the Mashona women always stamp "rukweza," etc., in stamp blocks to get rid of the hard husk before they grind it into a fine meal. They mix it with sufficient water, and boil it about half-an hour, continually stirring it with a stick, to make their porridge. With it they use salt, which they now obtain from Europeans. They used to obtain it by burning a certain grass growing besides the rivers, putting the ashes in water, filtering it through sand, and boiling the water till a sediment of salt was produced. Each village used to have its salt manufacturer. (Native labourers will require to be well provided with salt.)

"Munga," or "nyautzi," as the Zulus call it, is *penisetum typhoideum*. It is a small whitish millet-like grain growing on a head or cob something like a large bulrush, at the head of a stalk something like that of Kaffir corn. Natives *particularly dislike* the meal made from *this* grain by grinding it in European mills; they say the porridge from it gives them internal pains and dysentery, from the presence in it of particles of the flinty husk. They only eat it at home after this husk is got rid of by stamping, and it has been finely ground and made into porridge.

THE PACKING OF FRUITS AND SEEDS

BY J. H. HART, F.L.S.,

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(1.) FRUIT.

My first experience of packing fruit for ocean transit was in October, 1873. In that year I sent a box of Nova Scotia apples from that country to England. I ventured to mention at the time to Dr. Masters "I think Nova Scotia bids fair to become the apple-producing country of the future." How far this has been realised is within the knowledge of many who have seen these apples in the English market. My consignment was a successful one; Dr. Masters reported: "They were packed in coarse sawdust and came to hand almost without a bruise." These apples were among the first, if not the first, sent to England from Nova Scotia. To-day the trade is of considerable dimensions. I mention this to show that by good packing much may be done in the way of exciting interest in new productions in suitable markets.

Some people hold that only valuable goods are worthy of good packing, and that cheap things will not pay to pack well. Such arguments are fallacious. So far as my own experience goes, whatever is worth packing at all is worth packing well, for even if the packing costs more than the article itself it should nevertheless be put upon the market in the best possible condition. Cheap and ineffective packing is dear at any price. It is clear that it is better to expend 20 per cent. on packing, rather than lose 40 per cent. or 50 per cent. of the returns owing to defective packing. West Indian orange growers have been heard to say: "We cannot afford to pack the same as the Mediterranean people." The reply is clear. "Then do not expect to get a market for your goods." There can be little doubt that in the fruit trade the profit comes chiefly in the economy with which the packing is carried out. By economy, I do not mean cheapness. It is certainly false economy to pack *fully ripe oranges* in barrels for cheapness.

With fruit, as with plants the material must be in good order. It will never pay to shake down the oranges from the tree to the ground, carry them for miles in a cart and then shunt them into a barrel. Success can never attend such handling, for all fruit must be handled as carefully as eggs. A blow that would crack an egg, will certainly destroy a fruit; and if such fruit is packed, no matter how carefully, it will assuredly arrive at its destination in bad order. To secure arrival in good condition all fruit must have been carefully gathered, and, without exception, treated in the most careful manner to prevent bruising.

Fruit also requires certain treatment previous to packing, to assist in securing safe transit. This treatment is what I would call "hardening." No fruit should ever be packed when freshly gathered, but how long it should remain must be learnt by experience, as a great deals depends upon the state of the weather. Oranges should be picked at least three or four days before packing, and laid out in single layers until all the moisture or what is known as the "sweat" of the fruit ha disappeared. To pack fruit when wet or damp is to court certain failure. The full details of packing are too long to include in a paper of this kind.

There is one point in connection with temperature which must be taken into account. If fruit, such as bananas are kept at too low a temperature they become "chilled" and will rot before they will ripen. It has been frequently stated that to carry fruit successfully, it is necessary to use ice chambers. I believe this idea to be a mischievous one, and it has hindered in no little degree the problem of the safe transit of fruit. The Jamaica No. 11 mango was safely sent to England from Jamaica in 1873, when the transit took 21 days from port to port. In 1875, and again in 1891 the mangosteen reached home from Trinidad in good condition. In no case was cold storage used. Apples which reach the West Indies in ice vessels, if packed near the ice are valueless for flavour, while those brought over in well ventilated packages, stowed properly in a cool part of the ship arrive in

excellent condition, and keep their flavour for a great length of time.

The exact degree of temperature suitable for the cold storage of fruit is not sufficiently well understood. Some people take it to be at or near freezing point, while others adopt temperatures of say 40° or 50° Fah. This latter, I believe, would be a good temperature for fruits grown in a temperate climate, but if we are dealing with tropical fruits it is probably too low. Cold storage at freezing point may do for dead meat, &c., but it is not suitable for the preservation of fruit. Still, we must have *cool* storage, and how to obtain the desired temperature must be decided by ship owners and by shippers of fruit.

What is required is a well ventilated hold, maintained at a certain minimum temperature which should be some 10° or 15° below that at which the fruit matures. Fruit will stand considerable hardship, provided it is carefully gathered, well dried and well packed. It is not easy to say, however, which of these three conditions is essential. If a fruit is bruised in the picking, it is inevitably doomed to rot. If not carefully dried, it will almost as surely ferment and rot, and if squeezed or heated in the packing, it must arrive in a bad condition.

The best cases for packing oranges are those furnished with trays admitting one layer only, with bars to take the weight when set on end. A very good and serviceable case is one having a capacity of two cubic feet and divided in the centre. In a barrel the lowest row has to sustain the weight of all those above it, which may amount to something like three to four pounds per orange. *The continued use of the barrel for oranges and similar fruit helps to bring our beautiful West Indian fruit into grave discredit.*

The package of pine-apples has to be conducted on the same principle. They should never be packed in barrels but in light crates, each fruit having a separate compartment. Small and indifferent fruits are rarely worth shipping, and if in abundance should be preserved or sold locally.

Mangoes can be safely sent, if picked in the condition known as "full," so as to gradually ripen during transit. In this case, it is also necessary to separate the individual fruits, and high class fruit should be packed in the manner adopted for apricots and peaches by European growers, namely in single compartments with soft packing material.

The actual business of packing fruit is an art which only practice can perfect, and most of the failures are due to imperfect knowledge of the conditions which are necessary to success.

A common idea exists that cultivators can, by planting at certain times of the year, get fruit such as mangoes and pineapples to ripen at certain seasons. This may sometimes be possible, but I am of opinion, after a quarter of a century's experience, that the control which can be exercised by the grower over the time of ripening is small, and cannot be depended upon for successive seasons. If we could control wet and dry weather, in the same way as under glass cultivation, something might be done ; but until we are in a position to do this, the mango and pine-apple season will be in June, July and August, the coffee crop will come in November and December, and cacao will ripen in June and November, with variations of dates in accordance with the season.

There is great need for study of the possible means to get a crop of fruit out of season, for fruit out of season is well known to pay. I think however that more success will come, if the attack is carried on from a different direction. It is true that we might by withholding water imitate the dry season, and by giving water imitate the wet season; but still uncontrollable differences would yet remain, for it is clear that we could not control the state of the atmosphere surrounding the branches even if we kept the roots dry, and we could not give the dry air coincident with the dry season, during rainy weather, and if we kept a plant well watered, its branches would still be affected by the drought.

The best means to obtain the end in view, would be to seek plants which ripen earlier or later than the general crop, and by selection obtain varieties which come in extremely early, or conveniently late, and thus meet the demands of the "out of season" markets. Selection of this kind is carried out in Europe and America, and might equally well answer in the tropics if a little attention was devoted to the subject.

I have digressed somewhat from packing and transport of fruit but, I must plead the excuse, that we must know how to get our fruit before we can pack or transport it.—*West Indian Bulletin.*

(*To be Concluded.*)

NATURE STUDY LESSONS.

First Course in the Study of Plant Life.

Introductory.

This first course is intended to induce school children to observe the external features of plants, as seen in stem, roots and leaves, and the modifications of leaves including the flower and fruit.

The second course will necessitate a fuller study of the structure and functions of the parts of plants.

The soil, water and air will form the subjects of a later course.

N.B.—It must be borne in mind that every fact here mentioned should be verified by actual observation. Examples are given for the sake of convenience, but where these are not at hand, others must be sought for in order to prove each statement and fix it on the memory.

In looking at any collection of trees in Nature, you will observe that they differ considerably one from another. This is due to differences in the development of the parts of the trees.

A tree may be said to consist of (1) a stem bearing, (2) roots below, and (3) leaves above. Take any tree or plant in your school garden and see if you cannot divide it thus.

Let us take the stem as the most convenient part to start with and note certain facts about it.

THE STEM.

A stem may be erect, that is it may stand upright from the ground. Most large trees have stems of this kind.

An erect stem may be unbranched as in the coconut or branched as in the mango. In the coconut observe that all the leaves are borne at the top of the unbranched stem; in the mango the stem divides and sub-divides into branches of decreasing size, and the leaves are borne by the smallest twigs. Notice the unbranched and branched stems of trees near your school; observe that some trees are more branched than others, that the method of branching regulates the shape of the tree (compare the ironwood with the banyan tree), and that some trees, like the wild breadfruit, form a denser shade than others like the suriya tree.

A stem may be hard and woody. This is the case in trees which last a long time, as most forest trees. Many of these hard stems consist of wood yielding useful timber for building and other purposes. The Forest Department looks after such trees in our forests, and sees that the supply of useful wood does not become exhausted. Make a list of as many useful woods as you know, and say what they are used for.]

A stem may be very tall as in the red-flowered cotton tree, or inclined to be short as in the cashew-nut tree; it may be thin as in the arecanut or thick as in the coconut, or very thick as in some timber trees as Hora; it may have a rough bark as in mango or smooth as in the gauva.

But there are many stems which are more or less soft and pliable. In the young stage the stems of all trees are of this character, while plants which last only for a short time, and do not grow to any size, have also soft stems. Most of the vegetables you grow in your school garden are instances of the latter, *e.g.*, spinach.

A stem may be contracted, that is undeveloped in length, so that the leaves are more or less brought together, as in lettuce, or the common "aloe." Observe the plants with contracted stems near the school, and notice that before they flower their stems become elongated and bear leaves separated from one another. This is well seen in the lettuce.

Some stems are so slender that they cannot grow erect. Such stems may creep along the ground, as in the case of the sweet potato, or support themselves by twining round other trees as does the common long bean.

The long bean, like most twining plants twines from left to right. [Do you know of a plant that twines from right to left? If not, try and find one.] The grape vine has got some of its branches specially adapted for supporting itself. These branches sre in the form of coils which atach themselves to any support. In the common creeping Bignonia the branch is modified to form a claw-like structure consisting of hooks for climbing, [Hence the specific name of the plant, viz., unguis-cati, signifying the claw of a cat.] All these structures should be carefully exmained. Leaves are also modified to enable stems to support themselves, but of these we shall speak later. Some trees (like the Allamanda) have no special arrangements for climbing but scramble up other trees for support.

The stem of a tree sometimes bears sharp structures which are modifications of parts of the stem. The thorn of the orange is a strong woody structure, which, much as you may try, you cannot break off with your hand. The prickle of the rose on the other hand is a superficial outgrowth that can be removed without very great difficulty.

Stems do not vary much in colour, being generally green when young and brownish when old, but we have a red stemmed spinach. Do you know of other exceptional cases?

Stems are usually cylindrical. Some are square (madurutala), or triangular as in many sedges (*e.g.*, Tunhiriya). Exceptionally it is very irregular in form as may be seen in the different varieties of Prickly Pear (Katupathok) which takes very strange forms, being flat and leaf-like in the common variety.

The stem is, as a rule solid, but some stems are hollow as in the bamboo (una-gas).

Besides the stems that we find above ground, we have also underground stems, some thin and long as in the common couch grass (etora); others thick and short as in ginger (inguru); others again much swollen and sometimes forming large masses as in the yams. Such swollen underground stems can be distinguished from swollen underground roots like the radish (rabu) or manioc (manyoka) by the former having scaly leaves as in arrowroot (hulunkiriya) or minute buds as in the potato (arthapal). In the onion the stem is reduced to a very small structure round which the succulent leaves which envelope it are closely packed.

THE ROOT.

The parts of a plant which grow underground are generally spoken of as the roots. I have told you, however, that there are cases of underground stems such as the common conch grass (etora) which is such a troublesome weed because every piece of the underground stem left in the soil gives rise to a new plant. True roots have not this power of growing.

But there are also cases of roots which are produced above ground. Such are the hanging roots of the banyan (maha-nuga) and the thick roots given out by the screw pine (wetakeyia), which tend to reach the ground and become fixed in it. Notice that the hanging roots of the banyan eventually become woody and stem-like, so that the tree appears to be supported by a number of columnar stems. The old underground roots of large trees also become hard and woody like the stem, and give rise to new plants, like the breadfruit tree and other trees that you may know of. Hard woody roots sometimes grow out of the ground almond plank-like structures as in the Java forming (kekuna).

When speaking of plants with climbing stems I told you that there were other arrangements for climbing besides those I mentioned in the lesson on the stem. Well, plants sometimes climb with the aid of roots. Pothos (potawel) commonly found on jungle trees, climbs by means of its roots which attach themselves to the back of trees. The

main roots, however, are in the ground, while the climbing roots—which are quite distinct and different in appearance are specially adapted for clinging on to other trees. But there are plants which have no need to have their roots in the ground at all. Certain plants are known as parasites because they live on other plants. An instance of this is Loranthus (Pilila) so common on old mango and other trees. Plants such as this allow their roots to penetrate into the stems and branches of other trees on which they depend to a great extent for their nourishment. These useless parasites which rob useful plants of their food, and so weaken them, should be always carefully removed as soon as they are found.

Plants like orchids (*e.g.*, wesakmal) are spoken of as "air plants," because though they grow on other trees they get their food from the air and the solid particles brought to them by the wind.

Some underground roots become thickened and swollen, *e.g.*, the radish (rabu) and manioc (manyokka).

There is a very large class of trees which when young have one main root from which all other roots spring. Pull up a young jak (kos) plant and you will see that this is the case. The main root will appear as a continuation of the stem. There is another large class of plants which start with a number of distinct roots at the bottom of the stem. Pull up a paddy plant and compare the roots with those of the young jak. Plants like the paddy have no main root.

[Native names of plants not given above: Coconut, pol; mango, amba; ironwood, na; red-flowered cotton-tree, katu-imbul; cashew-nut, caju; arecanut, puwak; spinach, niviti; lettuce, salada; aloe (American) goni-gas; long-bean, mékaral; grape, mudarapala; allamanda, wel-rukattuna; orange, dodan; wildbread-fruit, del; sweet potato, batala.]

GENERAL ITEMS.

The following is a hint worth the attention of growers of the Cauliflower:—tying up is the main thing, for no matter how large they are, they will not sell well unless snow white; but it is not only tying up that does it, but vigorous growth and plenty of leaves shading the head. There is quite a knack about tying up. If done too soon or close they become stunted; if not tied close enough they become discoloured and look bad. The best way is this. Take a ball of string and wind it round from hand to elbow, then cut open the skeins, when the cut portions will be found of the required length. Gather just enough leaves to shade the head perfectly and no more than necessary, and tie them as low down as possible, just so low that the string is a trifle above the head, thus allowing the tops of the leaves to spread out somewhat in the air and not retard the growth of the plant. Tying should not be done till the Cauliflowers are about the size of an egg, or larger if the plant is extra heavy and the head well covered with leaves. The beds should be gone over about thrice a week.

In Edinburgh city a cattle dealer named Robert Stewart was fined £50 for "being the owner or consignee of a live cow and live heifer with the intention of disposing of them for food, while they were diseased and unfit for food."

How many of our local cattle-dealers desave a similar fine!